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STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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The Sun Never Sets... on Monel Pickling Equipment

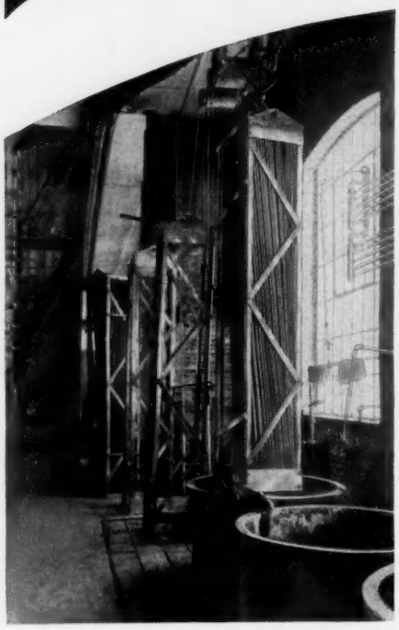
High strength combined with stout resistance to corrosion wins world-wide preference for Monel

A tube plant in Canada, a steel hollow ware factory in Australia, a tractor plant in Soviet Russia, steel mills in England and Belgium . . . in all of these places you find pickling equipment made of Monel.

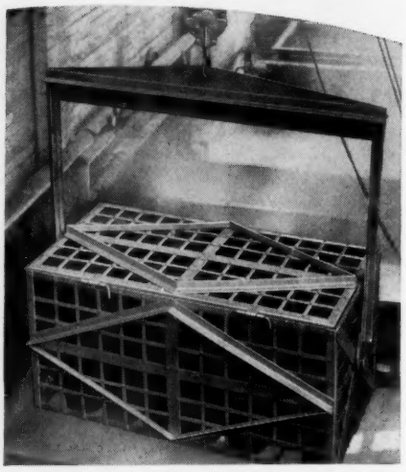
Monel's exclusive advantages are utilized for pickling equipment in every quarter of the globe. Combining corrosion resistance and strength, Monel makes possible strong, lightweight construction that cuts out dead-weight, reduces power costs, and increases payload. Monel's unusual properties also assure years of trouble-free service, with a minimum of repairs and replacements.

Write for further information on Monel. Ask for "Equipment Designs for the Pickle House" and "A Good Start to a Better Finish." Address:

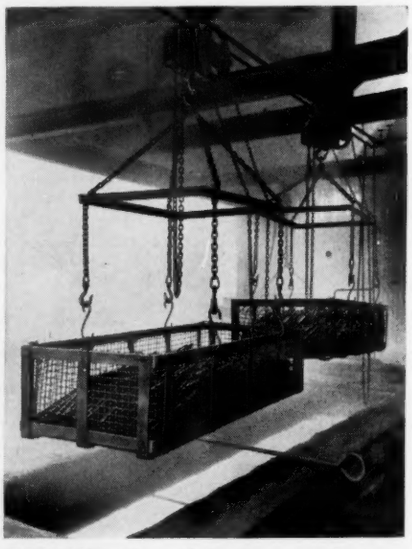
THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street New York, N. Y.



CANADA: All Monel crates used for pickling conduit pipe prior to galvanizing in the plant of a prominent Canadian company. The crates are two feet square and ten feet six inches high.

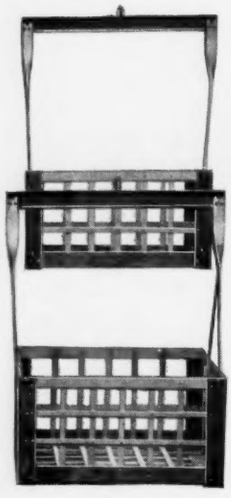


AUSTRALIA: Messrs. Chown Bros., Sydney, Australia, use Monel baskets of this type for pickling steel hollow ware prior to enameling. The basket shown has been in use three years in hot sulfuric acid with no sign of corrosion.



ENGLAND: One of the largest tube producers in England uses these Monel crates for pickling steel tubes. Although riveted construction is quite suitable for this type of basket, improvements in welding technique in the U. S. have been such as to indicate this method of joining to be even more satisfactory.

BELGIUM: Monel chains supplied to "Les Tubes de la Meuse" (steel tube drawers, Belgium). The chains were manufactured by a Brussels metal worker and are used in the pickling of steel tubes.



RUSSIA: Two of twelve Monel pickling baskets built by Klaas Machine and Mfg. Co., Cleveland, Ohio for export to Russia. The baskets are used in the forging division of a tractor plant.

"Monel" is a registered trademark of The International Nickel Company, Inc., which is applied to a nickel alloy containing approximately two-thirds nickel and one-third copper

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ WHAT will be the next development in the steel industry now that base prices on sheets and strip, as a result of an extended period of violent price cutting, have been reduced (p. 15) $4 a ton? It is recalled that leading steel executives on numerous occasions have pointed out that steel prices and wages are inseparably linked. And yet the reductions which were made in June, and now the reductions that were made last week, have been followed by no adjustment in the present high unit wage rates. While statements of third quarter earnings have not yet been released to the public it is known they will show that the industry has been operating in the red. Will prices go up, or wages down? The answer cannot be much longer deferred.

• • •

Consumers Benefit

In the meantime consumers are receiving all the benefit of lower steel mill costs. They are paying 40 per cent less for flat steel than in 1929 and 55 per cent less than in 1923. . . . Washington news writers got a real taste of the national labor relations board's policies when the board ordered a CIO election among workers at the National Press club. The newspapermen did not like the experience and are expected (p. 26) to be less sympathetic to the board in the future. . . . National economic committee's hearings are to begin (p. 26) Nov. 14, eighty-nine subpoenas have been issued in the glass industry. . . .Demand for a bureau of industry that will do for industry what the department of agriculture does for the farmer has more impetus (p. 26) at Washington.

• • •

Business Is Better

Business continues to improve. Steel production last week was at 51½ per cent of ingot capacity (p. 17) a gain of 2½ points. STEEL'S index of industrial activity moved up 4.1 points (p. 35) to 79 per cent, a new high for this year. . . . Upswing in automobile production continues (p. 31) with demand for 1939 models showing unusual momentum. The labor situation appears as the enly cloud in automotive skies. . . . One of the first repercussions of the recent drastic revision in the steel industry's price basing system is the decision of an Eastern mill (p. 16) to cease production of hot-rolled sheets because of newly created handicaps. . . . Indications are that the steel construction industry (p. 18) will enjoy more business in 1939.

• • •

Steels Best Materials

As softness of motor car suspension springs increases greater accuracy is necessary in measuring spring rates and loads. A new machine (p. 38) registers such measurements correctly. . . . Steel and alloy steels are the materials that give best service (p. 40) in equipment used in manufacturing synthetic rubber. . . . Powder metallurgy is finding new uses; an automobile builder is making small parts (p. 41) from iron powder bonded by heating and re-pressed in sizing molds to exact dimensions. . . . Development work is under way, it was disclosed at last week's American Gas association convention, for application of coatings on steel by passing it through furnaces in which the atmosphere (p. 47) is corrosion-resistant metal in vapor form.

• • •

Causes for Blowholes

A new blast furnace tuyere with lateral angle of 22½ degrees (p. 50) allows easier descent of the stock and results in improved furnace operation. . . . A new type roof and floor (p. 53) is made by welding shallow steel pans to steel supporting members and filling them with concrete. . . . A completely mechanized sand handling system reduces costs (p. 54) in a stove foundry. . . . Blowholes in steel castings are traceable (p. 57) to thirty-four different causes. . . . A spring washer manufacturer, as a result of requirements resulting from power wrenches, nut runners and high speeds on modern assembly lines, has installed (p. 58) a highly controlled heat treating plant. . . . Gearmotors for some applications (p. 60) now must pass a 70-decibel sound test.

E. L. Shaner

Guide to Treatment Shipped With the Steel

● Ryerson Certified Alloy Steels are not only shipped quickly, but complete information arrives with the bars, including chemical and physical properties and record of heat treatment results. In this way, the heat treater knows what is in each alloy and exactly how to treat it for the best possible results.

This unique alloy plan, never before attempted by any steel service company, is the outstanding feature of Ryerson Certified Steels.

Ryerson Certified Carbon Steels, Tool Steels and Stainless Steels are ordered to exacting specifications and pass rigid inspection before they are accepted for Ryerson stock.

For high, uniform quality, specify Ryerson Certified Steels. They cost no more and quick shipment is assured.

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- Alloy Steels—Tool Steels
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- Beams and Heavy Structurals
- Channels, Angles, Tees and Zees
- Hot Rolled Bars—Hoops and Bands
- Rails, Splices, Spikes, Bolts, etc.
- Plates—Sheets
- Strip Steel, Flat Wire, etc.
- Boiler Tubes and Fittings
- Welding Rod — Mechanical Tubing
- Rivets, Bolts, Nuts, Washers, etc.
- Reinforcing Bars
- Babbitt Metal and Solder

RYERSON STEEL-SERVICE

Major Trend in Use of Steel Reflected

In Sheet, Strip Price Reductions

■ SHEET prices broke widely last week. Ostensibly the result of weakness that had its inception at Detroit where automotive manufacturers have been dangling larger orders with the advent of the new model season, lower prices spread to encompass all buyers of most grades of flat-rolled steel.

Sheet prices at Detroit wavered last August also, but the rupture was localized and was temporarily checked. The important influence behind the pressure for lower quotations was created even before that time, however; in fact, it has been in the process of development for a number of years.

This influence is the rapid increase in capacity for producing sheets and strip.

Growth of continuous mill installations the past 12 years has not been stimulated alone by the economies offered by this type of equipment, since there has been an equally spectacular expansion in consumption of flat-rolled steel during that period.

As indicated in the accompanying chart, the outstanding feature of steel demand today compared with 1929 is the substantial increase in the share that sheets and strip represent of the total tonnage.

In 1929, when steel production set an all-time peak, sheet and strip output of 5,843,950 tons was 14.2 per cent of the year's rolling of all products.

In 1937, notwithstanding a decrease in total output of more than 16 per cent, sheet and strip production rose 76.5 per cent and constituted 30 per cent of all tonnage rolled last year.

Sheet Demand, Capacity Rise

In the first half of 1938, the sheet and strip proportion of the total dropped to 23.2 per cent, or 2,032,760 tons out of 8,747,803. This was partly a reflection of the heavy inventories of flat-rolled steel carried over by the automotive industry and other users from stocks accumulated last year.

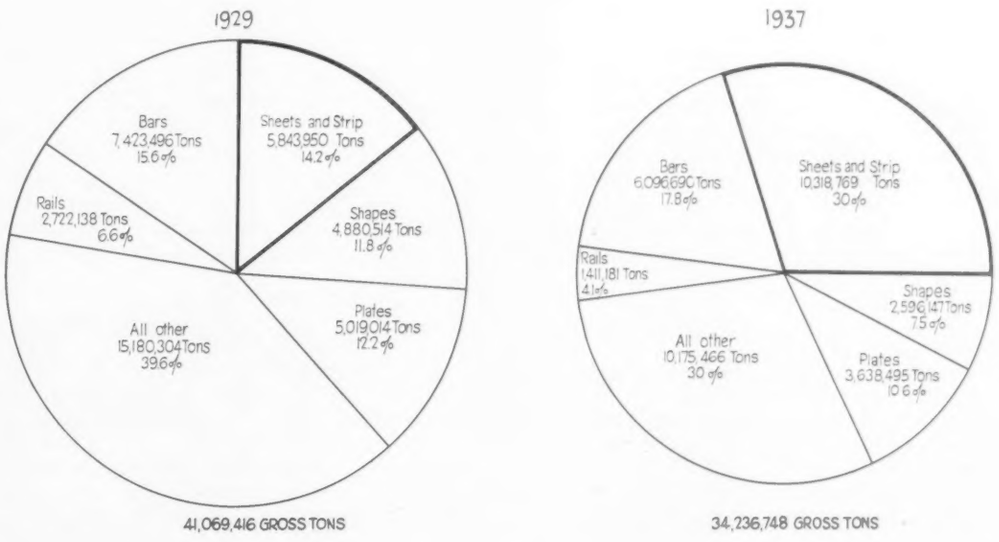
Growth in sheet and strip capacity since 1929 has kept pace with the increase in demand for these products. Total finished steel capacity in 1929 was 44,147,282 tons; by 1938 it had increased 6 per cent to 47,190,500 tons.

The rise in continuous sheet and strip mill capacity, however, has been spectacular. Continuous sheet and strip mills in 1929 had capacity of only 2,778,500 tons, but today it is 13,613,500 tons, an increase of 390 per cent.

These figures indicate the rapid development of flat rolled steel demand resulting from needs of the automotive industry and enlarged use of sheets and strip in manufacture of household and other equipment. The modern continuous mill is able to produce steel of widths demanded by development of the all-steel body for automobiles and other uses requiring unusual size and improved quality.

Since American Rolling Mill Co., Middletown, O., built its first continuous mill at Butler, Pa., in 1926, other steelmakers have followed until now 27 such installations are in service. At the end of 1929, seven continuous mills had been built. Since then, 20 such mills have been added, the most recent being by Inland Steel Co. at Indiana Harbor, Ind., its second continuous unit. In

How Proportion Of Sheet and Strip Output Has Increased Since 1929



the meantime, older and slower types of sheet and strip mills have been abandoned.

Of the 47,190,500 tons of finished steel capacity the first of this year, sheet and strip mills of all types accounted for 14,833,334 tons, or 31.4 per cent.

Comparing this percentage with the 30 per cent that sheets and strip represented of total finished steel production in 1937 it is evident that the building of continuous mills merely has matched the trend toward increasing consumption of flat rolled products.

Sheet Capacity Not Excessive

Charges that the steel industry has created excessive sheet and strip making capacity are unwarranted, on the basis of these figures. Nevertheless, it is obvious that this huge and costly capacity represents a heavy overhead charge and serves to stimulate price concessions when business is slack.

In periods of active business this pressure is lifted—as was witnessed in early months of 1937 when sheet and strip deliveries were delayed many weeks as backlogs accumulated in the face of strong prices.

Inherent economies in this method of producing flat rolled steel connote substantial profits for its operators, since the mass production of sheets results in low costs when active business permits steady mill schedules. Prices have shrunk to such an extent, however, that the consumer, rather than the producer, has been the important beneficiary of this development.

A study of the trend in base prices alone tells only part of the story. Cold-rolled sheets, widely employed by the automotive industry, in 1929 were quoted 4.10c, Pittsburgh base.

Including the recent reduction, the base price lately showed a shrinkage for the nine years of nearly $25 a ton. In 1929, there were extras that no longer are applied, while net return to the mill also has been lowered by changes in freight charges.

Including all of these revisions, it is estimated that the automotive industry today is buying the bulk of its flat rolled steel requirements for about 40 per cent less than it paid in 1929. Since 1923, the saving is placed at nearly 55 per cent.

In addition to economies effected in prices alone, another substantial advantage to the user has resulted from the improvement in quality of sheets and strip the past ten years. Better surface finish and superior drawing qualities have meant not only definite savings in fabricating costs but have been directly responsible for the creation of new and improved manufactured products.

Sheets Down $12 Since New Bases Were Announced; Eastern Mill Quits

NEW YORK

■ ONE of the first repercussions of the drastic revision in the steel industry's pricing system is seen in the decision of the Worth Steel Co., Claymont, Del., to abandon production of hot-rolled sheets indefinitely.

Prior to establishment of additional bases on hot-rolled sheets at Sparrows Point, Md., Buffalo, Youngstown, Middletown, Birmingham, and Granite City, Ill., steel sheets were sold in the East on a basis of Pittsburgh plus freight. This meant that hot-rolled sheets brought 2.40c, Pittsburgh, or 2.72c, delivered Philadelphia. The freight was 32 cents.

Under the present setup, this material sells at 1.95c, Sparrows Point, plus 17 cents freight, or 2.12c, delivered Philadelphia. As a result, hot-rolled sheets in Philadelphia are down $12 per ton.

Under the previous setup, Worth received a net price of 2.72c, less the 5 cent freight rate from Claymont to Philadelphia or 2.67c mill. The present net price is 2.07c mill.

Taking New York as another example, it is shown that the reduction was almost as great. Consumers in this area paid 2.40c, Pittsburgh, plus 36 cents freight, or 2.76c delivered. The same consumers now pay 1.95c, plus 24 cents freight, or 2.19c delivered, the difference being 57 cents per 100 pounds, or $11.40 a ton.

The net reduction to customers in the Boston area was slightly over $10 per ton. Based on a 44-cent rate from Pittsburgh, the delivered price was 2.84c, compared with present price of 1.95c, plus 36 cents freight, or 2.31c. The difference in this case is 51 cents per 100 pounds.

The foregoing takes into consideration not only the effect of the new basing system, but also the reduction of $4 a ton in the base price of hot-rolled sheets, announced last week.

So far, marketing plans of other steel producers in the East have not undergone substantial revisions. Other important steel products were affected by the shake-up. Galvanized sheets, for example, now are based at Sparrows Point at 3.50c, or 3.67c delivered Philadelphia, compared with 4.12c when they were based at 3.80c, Pittsburgh. The net reduction in this market is $9 a ton.

Steel plates, of course, now are marketed on a Claymont base in most of the East, instead of on a Coatesville base as previously. The carload freight from Claymont to Philadelphia is 5 cents, from Coatesville 9½ cents.

LABOR

"PUT HOUSE IN ORDER"— MURRAY TO STEEL INDUSTRY

■ STEEL price reductions announced last week provoked an alarmed statement from Philip Murray, SWOC chairman. Avoiding direct mention of wages, Murray warned the reductions are placing the steel industry in a position similar to that of "the bituminous coal industry prior to the passage of the Guffey coal stabilization act."

Continued Murray: "We challenge the steel industry to assume leadership. The federal administration should offer its aid and co-operation to the industry to avert the certain consequences which must follow from the present conditions in the industry.

"If the steel corporations cannot put their own house in order, it is the avowed purpose of the organized steelworkers of this nation to promote a constructive legislative program that will adequately protect the interests of the industry and its workers."

COPPER & BRASS REPORTS MONTHLY TO WORKERS

Monthly letters to all employes discussing the company's financial and business condition and policies have been inaugurated by the Revere Copper & Brass Inc., New York.

First of the series in the "know your company" program has just been issued over the signature of C. Donald Dallas, president. It contains a message to employes from the president, a simplified financial statement, general comment on the business outlook and a brief historical sketch.

TELLS IN RADIO TALK HOW STEEL HELPS TOWN

What steel plants mean to the communities in which they are located was explained by E. F. Entwisle, general manager, Bethlehem Steel Co.'s Lackawanna plant, in a recent talk from a Buffalo radio station.

Bethlehem, said Mr. Entwisle, bought $5,000,000 worth of goods and services in Buffalo during 1937. This, he continued, "means that when steel operations improve, then your job as a stenographer, soda clerk, carpenter, or general manager is more secure, because as the steel

business improves the entire business of the city enjoys better times."

REPUBLIC'S PAYROLL UP

Republic Steel Corp. payrolls for its Cleveland operations approximated $2,750,000 for the third quarter, compared with $2,400,000 in the second. The company reports its payroll total is continuing upward.

September Machine Tool Orders Down Slightly

■ Machine tool demand in September receded slightly from the August level, according to the National Machine Tool Builders' association, Cleveland. The association's order index dropped 3.5 points to 117.4, compared with 120.9 in August. Three-month average trend continued upward to 109.3, against 93.6 in August.

Steel Corp. September Shipments Gain 3.4%

■ Shipments of finished steel by the United States Steel Corp. in September were 577,666 tons, an increase of 19,032 tons, or 3.4 per cent, over the 558,634 tons shipped in August. This is the largest monthly total since November, 1937, at 587,241 tons. Compared with shipments of 1,047,962 tons in September, 1937, the loss is 470,296 tons. Aggregate for nine months this year is 4,588,224 tons, against 10,956,846 tons in the period last year.

District Steel Rates

Percentage of Ingot Capacity Engaged in Leading Districts

	Week ended Oct. 15	Change	Same week 1937	Same week 1936
Pittsburgh ..	40	+ 3	60	77
Chicago	45.5	+ 1	57	76
Eastern Pa. ..	32	— 1	51	48.5
Youngstown .	51	— 4	58	78
Wheeling ...	54	None	74	95
Cleveland ...	56	+ 5	68	79.5
Buffalo	49	— 2	67.5	84
Birmingham .	57	None	70	64
New England.	70	+ 5	70	75.5
Cincinnati ...	70	+27	70	96
St. Louis	48.5	+ 3	60	†
Detroit	77	+ 5	92	100
Average ...	51.5	+ 3	63	75

† Not reported.

U. S. STEEL CORP. SHIPMENTS

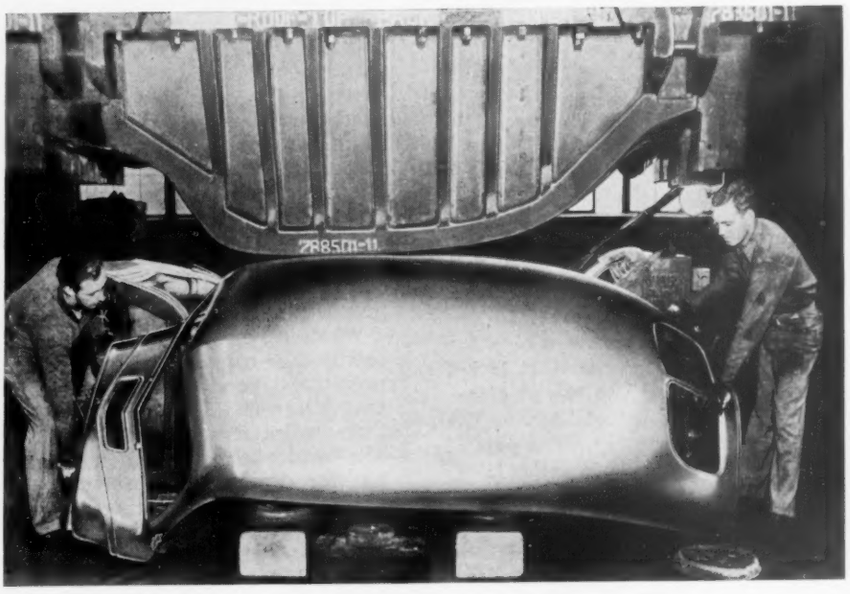
(Inter-company shipments not included)

(Tons)

	1938	1937	1936	1935
Jan.	518,322	1,149,918	721,414	534,055
Feb.	474,723	1,133,724	676,315	583,137
Mar.	572,199	1,414,399	783,552	668,056
April	501,972	1,343,644	979,907	591,728
May	465,081	1,304,039	984,097	598,915
June	478,057	1,268,550	886,065	578,108
July	441,570	1,186,752	950,851	547,794
Aug.	558,634	1,107,858	923,703	624,497
Sept.	577,666	1,047,962	961,803	614,933
9 mo.	4,588,224	10,956,846	7,867,707	5,341,223
Oct.		792,310	1,007,417	686,741
Nov.		587,241	882,643	681,830
Dec.		489,070	1,067,365	661,515
Y'rly adj.		†77,113	†40,859	†23,750
Total		12,748,354	10,784,273	7,347,549

†Deduction.

Front, Top and Back, All in One Piece



■ **A few years ago it was thought impossible to stamp the cowl, top and back of an automobile in one piece. Today it is routine procedure in the DeSoto plant, Detroit**

PRODUCTION

■ STEELWORKS operations last week advanced in seven centers, were unchanged in two and declined in three. The net result was an increase of 3 points in the national rate, to 51.5 per cent. Indications are for further advance this week.

Youngstown, O. — Averaged 51 per cent, 4 points lower than the preceding week. Starting at 49 per cent the rate increased to 55 per cent Friday when Republic Steel Corp. lighted five open hearths. This week the rate is expected to rise to 57 per cent as Republic adds two more open hearths and Carnegie-Illinois Steel Corp. begins continuous operation over the week end.

Cleveland—Addition of three open hearths by one interest and dropping of one furnace by another gave an increase of 5 points to 56 per cent. Indications for this week are for a still further increase.

Chicago — Rose 1 point to 45.5 per cent as curtailment by two interests was more than balanced by an increase by another.

Cincinnati — Up 27 points to 70 per cent, resulting from lighting of five open hearths by one producer.

St. Louis — Increased 3 points to 48.5 per cent, regaining the loss of the preceding week.

Detroit — Advanced 5 points to 77 per cent. Four new open hearths of Great Lakes Steel Corp. now are operating, giving this interest 15 active out of 16.

Birmingham, Ala. — Steady at 57 per cent the fifth successive week, with 13 open hearths in production. Tennessee Coal, Iron & Railroad Co. has reopened its No. 9 ore mine at Wenonah, Ala., idle since June 21.

Central eastern seaboard — Down 1 point to 32 per cent, as a platemaker took off two open hearths.

New England — Addition of one open hearth increased the rate 5 points to 70 per cent.

Pittsburgh — Greater activity by an important producer raised the rate 3 points to 40 per cent, although some smaller interests operated at a lower rate than in the preceding week.

Wheeling — Unchanged at 54 per cent.

Buffalo — Declined 2 points to 49 per cent.

■ Manufacture, transportation and erection of a gross ton of structural steel requires 89 man-hours of indirect labor, nine hours direct labor, according to the American Institute of Steel Construction.

"Thousand Miles of Bridges Needed To Solve Urban Traffic Problem"

■ MORE than 250 members and guests, attending the sixteenth annual convention of the American Institute of Steel Construction, Oct. 11-14, at French Lick Springs hotel, French Lick, Ind., listened to a well-balanced program of addresses and reports on many technical, social and economic phases of the fabricated steel industry and departed with a new appreciation of the opportunities which lie in the further development of new and extended uses for steel.

One of the opportunities, which was accentuated frequently in the program, lies in the improvement of the nation's motor vehicle transportation system. Reducing congestion and accidents inherent to present-day automobile traffic constitutes one of the country's most pressing problems.

This point was emphasized in an outstanding address by Dr. Miller McClintock, director, Yale university bureau for street traffic research, on "Improving Our Highways."

Dr. McClintock made the challenging statement that to solve the traffic problem in urban districts American cities need, and on a sound economic basis can afford to pay for 1000 miles of bridge structures.

This construction, he said, would solve the problem of urban traffic congestion and accidents, would increase the utility of existing motor vehicles, provide opportunity for the use of 5,000,000 additional units, and would require 700,000 tons of structural steel or its equivalent.

Traffic Toll Heavy

According to Dr. McClintock, our attempt to operate 30,000,000 automobiles on 3,000,000 miles of roadway results annually in killing 36,000 persons, permanently disabling 125,000 and injuring 1,200,000. At the same time, the average speed of traffic in cities is only 17.5 miles per hour. This inefficient operation of the nation's motor vehicle transportation system deprives the public of some of the deserved benefit of its great investment in highways and automobiles.

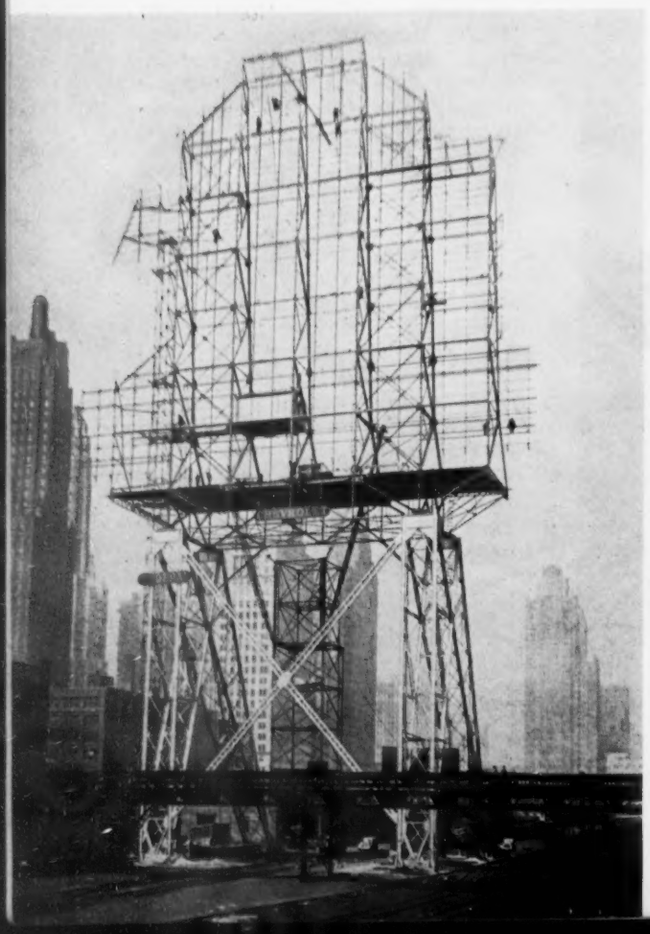
An extensive survey conducted for the city of Chicago showed that in almost all cases traffic congestion and accidents are caused by:

1. Medial friction (difficulties arising from opposed streams of traffic).
2. Marginal friction (difficulties arising from obstructions at sides of roads).
3. Intersectional friction (difficulties arising when streams of traffic cross at grade).
4. Internal stream friction (difficulties arising from slow and fast vehicles going in same direction).

When the typical American street or highway is tested against these causes of accident and congestion, it is found to be ill adapted to efficient traffic operation. The street best adapted to the problem, declared Dr. McClintock, is the limited way or divided road. Furthermore, he believes that the most economic method of providing a limited way in many urban sections is to build elevated structures.

To persons inclined to think that such structures are too costly, he pointed out careful studies show that where 50,000 vehicles are carried on a highway daily, an increase in average speed from 17.5 to 40 miles per hour justifies an expenditure of $7,000,000 per mile—assuming the economic value of time saved at 1¼ cents per minute. Elevated structures can be built for $500,000 to $1,000,000 per mile. Moreover, elimination of congestion improves property values.

Widening existing streets does not solve the congestion or accident problem. Woodward avenue in Detroit, he said, was widened for three miles at a cost of $14,000,000. The widening permits a slightly heavier flow of traffic but it has not solved the problems of congestion or accident. The same amount of money would have built 14 miles of limited way structures, which would have solved both problems of accident and congestion, and would have increased the flow of traffic to an average of 40 miles per



Steel To Support Gigantic Sign

■ **This structural steel frame has been erected at Randolph street and Michigan avenue, Chicago, to support a sign for Chevrolet cars. It is 112 feet high to the platform and 270 feet high to the extreme top. The pair of diagonals in the lower part are 120 feet in length. Some idea of the size of the frame may be obtained by noting the steelworkers on various portions of it. Photo, courtesy, American Institute of Steel Construction**

hour, with almost 100 per cent safety.

Major V. J. Brown, publishing director, *Roads and Streets*, Chicago, suggested as an approach to problems of developing new markets, the following: New higher strength structural steel; deeper rolled beams; rust-resistant steels; lowering of factor of safety in design; surface treated steels that will eliminate annual maintenance costs. He stated there are 20,000 obsolete bridges in state highway systems; replacing these offers a huge market.

Increases in several types of construction in 1939 were predicted by Lowell J. Chawner, chief, division of economic research, bureau of foreign and domestic commerce.

"It appears likely," he said, "that residential building in 1939 will be substantially larger than it has been during the past three years, possibly by as much as 40 per cent.

"Factory building fell off sharply in 1938 from the rather high levels prevailing in 1937. In view of recent improvements in industrial production it seems probable factory building in 1939 will be somewhat higher, possibly 30 per cent, than it has been during the present year.

"In view of the high vacancies still existing in commercial buildings throughout the United States, it is hardly likely that this type of construction will experience any substantial increase, although a slight advance of possibly 15 per cent may not be unlikely.

"Electric light and power construction may very well experience a considerable increase in volume, possibly 20 per cent over this year's activity.

"In view of the present unsatisfactory condition of railroad earnings, this type of work is not likely to be much higher than it has been during the present year.

"The above guesses are highly conjectural in view of the fact that we still have three months more of the present year to run and that the controlling conditions for 1939 have not been clearly defined."

1,000,000 Tons for WPA

WPA projects promise to make 1939 a much better year for structural steel than was 1938, reported Robert T. Brooks, executive vice president. Approved are nearly 7000 projects, costing $1,500,000,000. Actual construction has started on 700 projects.

Individual reports on 1500 of the 7000 approved projects indicate structural steel requirements will be 200,000 tons. From this and other data, the institute calculates more than 1,000,000 tons will be used in the entire program.

Since these projects must be under contract by Jan. 1, 1939, and completed by July 1, 1940, the larger part of the tonnage will be furnished during 1939 and some will be supplied in the current quarter.

"This has been a year of test and trial," said Clyde G. Conley, president of the institute, in his address.

"We do not get rid of causes by criticising their manifestations. The abortive efforts made by politicians to win the votes of the majority should not inspire us to criticise individuals. President Roosevelt is not the cause of the trouble, but merely the result of the trouble.

Urges Industry To Speak

"While we are quarreling over the polls, disagreeing over the details, we are permitting the populace to carry everything before their demands. Social security, collective bargaining, wage floors and all the bills drafted in the hope to improve the condition of the working man were once important plans in the platforms of the socialist and communist parties. Today they are honored planks in both the Republican and Democratic party platforms.

"Those measures have gained responsible acceptance, not because of any sound economy behind them, but because the intelligent industrialist has been afraid to speak out and explain himself. The industrialist has been reluctant to educate the masses to a better understanding of the problems.

"It is probably too late to reverse this trend in government. You can change the personnel in the White House, but you cannot alter the trend. Definitely we have lost to the government the right to regulate our industrial relations problems, and there is not much that any of us can do about it.

"Next there is to be made an attempt on the part of the politicians to regulate our price structure. Are we going to be just as awkward and lose that right also to the government? If we lose our right to price our product and our services, we will lose it because of our failure to make the public realize that competition is still the rule of the industry, and because of our failure to expose the propagandist's claim that monopoly is rampant."

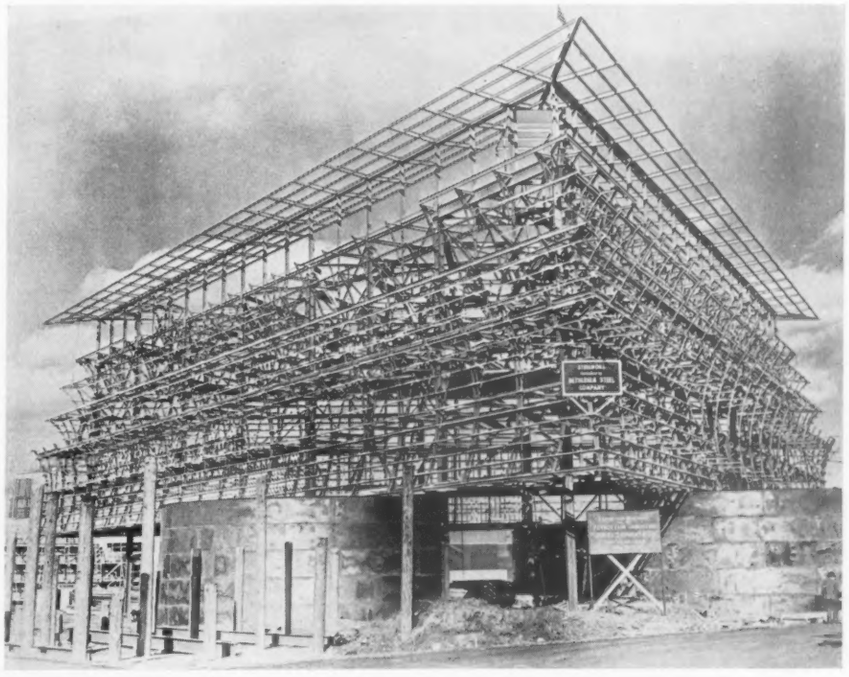
"Advertise the structural steel fabricating industry," recommended V. G. Iden, institute secretary.

"A depression is rather deadening to initiative," he admitted. "Yet, we would be wrong to expect that our competition has been taking it lying down.

"Have you heard about fire-proof lumber? Are you acquainted with the work of the Wood Products Laboratories? Did you read any-

(*Please turn to Page* 94)

Structural Steel for Fair



■ **Steel framework for Petroleum Industry's New York World's fair building was completed last week. More than 638 tons of beams and girders went into the structure, 200 feet long on each side, 80 feet high. It rests on 21 columns, and four huge replicas of oil tanks. Framework will be covered with sheets of corrugated metal in four flaring tiers suggesting a cooling system**

Machine Tool Dealers Hold Largest Convention; Good Selling Stressed

■ ANNUAL convention of the Associated Machine Tool Dealers of America, Oct. 10-11, Cincinnati, developed a series of inspirational addresses through which one thread of thought was constantly recurring.

Speakers stressed that manufacturers, today more than ever before, must adopt the new and modern in equipment. On the salesman rests responsibility for carrying this message.

The convention, held in Hotel Alms, was adjudged the largest ever sponsored by the association, founded 14 years ago. Nearly 200 members and guests from Cincinnati machine tool companies attended the annual banquet.

These officers were re-elected: President, A. G. Bryant, Bryant Machinery & Engineering Co., Chicago; vice president, John Sauer Jr., Peninsular Machinery Co., Detroit; secretary-treasurer, E. P. Essley, E. L. Essley Machinery Co., Chicago.

Name Executive Committee

Named to the executive committee, terms expiring in 1941, were: William T. Todd Jr., Somers, Fitler & Todd Co., Pittsburgh; George Habicht, Marshall & Huschart Machinery Co., Chicago; and John Cetrule, Triplex Machinery Co., New York.

George A. Fernley, Philadelphia, was continued as advisory secretary, and Thomas A. Fernley Jr., Philadelphia, as executive secretary.

Echoes of the European disturbances which culminated in the four-power agreement were heard at the annual banquet in the address of Col. H. A. Toulmin Jr., Dayton, O., an authority on national defense.

He contended that England made concessions while biding its time, and that a major conflict is inevitable. Meanwhile, preparations go on unretarded. He cited, as proof, the most recent aims of Germany to build up Rhine river fortifications, as a means of closing her "back door" to France, before further aggressions to the eastward.

"The next war will be fought with machine tools," Colonel Toulmin said. "Tanks, armored cars, automatic rifles and other war equipment supersede man-power alone."

Another speaker at the banquet was Mason Britton, vice chairman, McGraw-Hill Publishing Co. His topic was, "What Shall We Do to be Saved?" He urged replacement of antiquated machinery, quoting surveys showing 60 per cent of all machinery in plants in the United States is more than 10 years old.

At the opening session Mr. Bryant reviewed the success of a sales clinic held in Dearborn, Mich., earlier in the year, and sought to impress the value of a correct sales technic in offering machine tools.

George R. Ray, Marshall & Huschart Machinery Co., Chicago, and L. H. Pratt, Henry Prentiss & Co. Inc., New York, outlined sales control methods.

An original one-act melodrama was offered by J. F. Owens, J. F. Owens Machinery Co., Syracuse, N. Y., and F. W. Schiefer, F. W. Schiefer Machinery Co., Rochester, N. Y. The moral was: A machine tool salesman should be an advisor to the customer rather than a mere order-taker.

A. G. Bryant
Re-elected president, Associated Machine Tool Dealers of America

Tell Berna, general manager, National Machine Tool Builders' association, Cleveland, in a "message from the manufacturers" stressed dependence on good salesmanship. Back of aims for volume, he said, is the ultimate purpose of retaining industrial leadership for the United States.

Walter E. Blank, foreman, toolmaking department, National Cash Register Co., Dayton, emphasized that manufacturers in these times must be progressive in order to exist.

"Do not hesitate to discard old machinery, take on the new, if by such action costs may be lowered or products improved," he said.

Committee reports were submitted at an executive session by Mr. Bryant, Mr. Essley, and Mr. Fernley, executive secretary; C. C. Brogan, W. E. Shipley Machinery Co., Philadelphia; George J. Zimmerman, Strong, Carlisle & Hammond Co., Cleveland; G. J. Hawkey, Cleveland Duplex Machinery Co. Inc., Cleveland; John P. Tierney, General Machinery Corp., Boston; Mr. Owens, Mr. Sauer; Harry Barney, Barney Machinery Co., Pittsburgh; J. W. Wright, Colcord Wright Machinery & Supply Co., St. Louis, and William F. McCarthy, Henry Prentiss & Co. Inc., New York.

Formal sessions were interspersed with visits to shops of Cincinnati machine tool manufacturers. A specially conducted inspection trip was scheduled to the shops of the Cincinnati Milling Machine Co.

British Delegates Attend Porcelain Enamel Forum

■ A record-breaking attendance marked the third annual porcelain enamel forum of the Porcelain Enamel institute at the University of Illinois, Urbana, Ill., Oct. 12-14. Registration included 200 representatives from all branches of the industry and 112 students of the university enrolled in ceramic engineering.

An international atmosphere pervaded the forum through attendance of nine members of the British Institute of Vitreous Enamellers of London and one associated with the enameling industry in Sweden. As announced in STEEL for Sept. 26, p. 53, the British delegation came to the United States Oct. 8 to make a ten-day airplane tour of plants in the eastern area of the United States and to participate in the forum. Two papers presented by the Britishers afforded a comparison of American and British enameling practice.

Members of the delegation from abroad were: B. B. Kent, Sterling Mfg. Co., London; C. J. Baines, C. J. Baines & Co. Ltd., Sutherland Colour Works, Stoke-on-Trent; A. G. Gray, James Gray & Sons Ltd., London; W. Thomason, F. I. C. Stewart & Co. Ltd., Paisley Works, London; J. Nicholls, Hurst Hill Enamel Co., Deepfields, Staffordshire; W. H. Whittle, W. H. Whittle Ltd., Manchester; C. P. Stone, Ferramic Industries Ltd., Welwyn Garden City, Herts; W. Astles, Union Oxide & Chemical Co. Ltd., London; A. J. Somer, Borax Consolidated Ltd., London; and F. Gieseke, Kockums Emaljerverk, Ronneby, Sweden.

A report of technical sessions of the forum will be presented in STEEL for Oct. 24.

■ For nine months ended Sept. 30, Woodward Iron Co., Woodward, Ala., reports a net profit of $303,696. This compares with $654,627 in the period last year.

Instrumentation in Steel Industry Improves Product and Lowers Cost

■ KEYNOTE of the conference on instrumentation in the steel industry held Oct. 14 and 15 at Carnegie Institute of Technology, Pittsburgh, was sounded by M. F. Behar, editor, *Instruments*, in the opening address. Mr. Behar stated the social and economic significance of the conference was that it disproved by facts and figures the theories of those who seek to oppose technological advancement on the ground that it creates unemployment.

He stated further that this type of opposition was emanating not entirely from radical political groups, but rather from so-called enlightened and cultural organizations. That it is not coming from the labor group alone is obvious from a study of the CIO handbook entitled "Production Problems," which recognizes the fact that technology produces lower unit cost and hence greater volume and more return to the worker.

First of the four technical papers presented at the session was a study of blast furnace instrumentation prepared by F. N. Hays and J. P. Mikaloff, Carnegie-Illinois Steel Corp., Duquesne, Pa. The authors recounted the fact that blast furnace operators had accepted application of instruments for operating guidance before the value of this had been generally recognized by other branches of the industry.

There are eleven indicators and controls which are valuable aids in the operation of a blast furnace. These are blast temperature, automatic hot blast temperature control, automatic combustion control for stove burners, stove stack temperature, stove dome temperature, stock line recorder, top temperature, blast pressure, top pressure, blast volume, and humidity and atmospheric pressure.

Used For Tests

In addition to these instruments in general use around a blast furnace, there is also the laboratory apparatus for determining the analysis of the top gas, the portable Orsat, dust determination apparatus and sometimes flow meters. Speaker discussed the place of each of these instruments in the blast furnace operations and outlined the value of each.

Open hearth instrumentation was discussed in the afternoon session Thursday, with a paper on this subject being presented by E. T. W. Bailey, combustion engineer, Steel Co. of Canada Ltd., Hamilton, Ont. Mr. Bailey's paper outlined difficulties in applying automatic control to the open hearth. Most important, of course, is that there is an unmeasurable rate of load.

The speaker described experiences of the Steel Co. of Canada with a furnace of this nature, completely equipped with instruments for indicating, recording, integrating and controlling various variable factors.

Charles A. Carpenter, local manager of the department of commerce, bureau of foreign and domestic commerce, spoke at the dinner held Thursday night. His subject was the "Need for More Technology," and he brought out that the furthering of technological development means the spending of substantial sums of money, which in itself means employment.

At the Friday morning session, J. L. Whitten, Lee Wilson Engineering Co., Cleveland, gave his paper entitled "Rolling Mill Instrumentation," covering actual rolling and forming processes in which quality of the finished product is determined.

Rolling temperatures, stated Mr. Whitten, are the newest and most important factors in mill instrumentation. It has been only since introduction of the photo-electric cell that accurate readings of temperature of moving steel could be had. Modern methods enable rollers to determine temperature of any point along a slab.

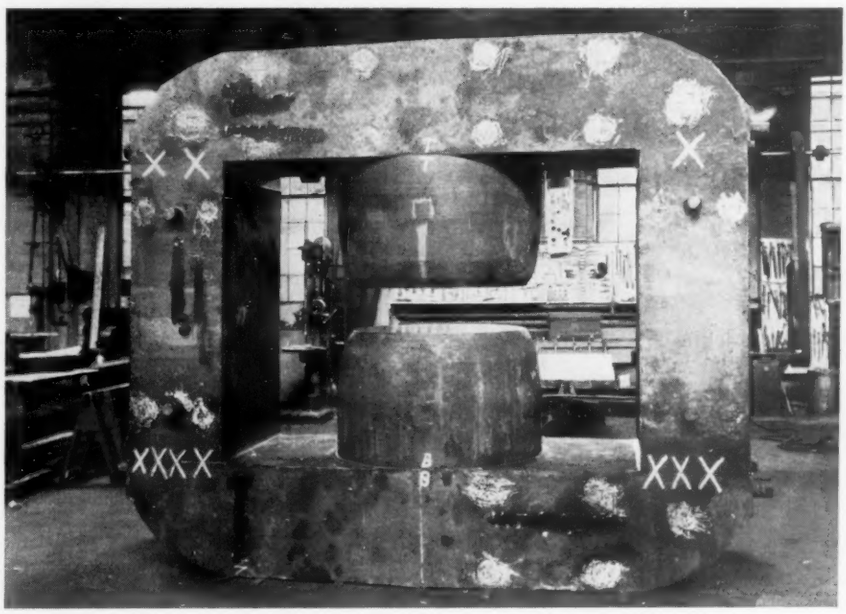
Installations of this type equipment on various types of rolling mills were described by Mr. Whitten. He outlined also possibilities of this equipment in recording and control of furnace temperatures, in soaking pits and other heating units which are necessary adjuncts to a rolling mill.

Final paper of the session was presented Friday afternoon by W. B. Skinkle, secretary and engineer, Pittsburgh district power committee, United States Steel Corp., Pittsburgh.

Power Costs Lowered

Mr. Skinkle's work dealt with use of instruments in power control, and numerous instances were cited where proper timing of an industrial process had saved substantially in power costs by keeping the load heaviest at times when power was cheapest. Mr. Skinkle showed how the load factor was controlled in various plants of the United States Steel Corp. subsidiaries in conjunction with prearranged schedules determined by the expected amount of production for the month, and demonstrated savings which resulted from such a program.

80-Ton Magnet for Study of Nuclear Physics



■ **Nearly 80 tons of electro-magnet iron was cast into frame and cores of this huge cyclotron magnet which Ohio State university will use in disintegration of atomic nuclei and production of artificial radio activity. Diameter of cores is 50 inches; pole faces, 42 inches. Top pole is held by one bolt 3 inches diameter; bottom pole by two 1-inch dowels. Iron, frame and cores were made by American Rolling Mill Co., machining by Mosler Safe Co., Hamilton, O.**

MEETINGS

CHICAGO AIME SCHEDULES SIX EVENTS FOR SEASON

■ A NUMBER of interesting meetings are planned by the Chicago section, Institute of Mining and Metallurgical Engineers during the coming season. On Nov. 2, C. K. Leith, professor of geology, University of Wisconsin, Madison, Wis., will discuss the "Role of Minerals in the Next World War."

A symposium on "Process and Manufacture of Open-Hearth Alloy Steels," will be presented Dec. 7 by John J. Golden, superintendent, No. 2 open hearth, South works, Carnegie-Illinois Steel Corp., Chicago. Written discussion will be contributed by R. S. Archer, chief metallurgist, Chicago district, Republic Steel Corp.; W. M. Lindsey, and M. L. Devaney, Carnegie-Illinois Steel Corp., South works, Chicago; and B. F. Courtright, Wisconsin Steel Works, Chicago.

Dr. C. H. Behre, professor of geology, Northwestern university, Evanston, Ill., will discuss "Over Europe Under Ground," at the Jan. 4 meeting; and Dr. Kammer, medical director, Inland Steel Co., Chicago, will speak on "Health Problems in Steel Production" on Feb. 1.

On March 1, Paul C. Van Zandt, operating vice president, Universal Atlas Cement Co., Chicago, will discuss "Modern Developments in Use of the Wet Process in Cement Manufacture," H. F. Hebley, advisory engineer, Commercial Testing & Engineering Co., Chicago, will speak on "Statistical Methods as Applied to Industry." C. H. Benedict, metallurgist, Calumet & Hecla Consolidated Copper Co., Calumet, Mich., will address the April 12 meeting on "Some Phases of the Metallurgy of the Lake Superior Copper District."

PORCELAIN ENAMEL GROUP DEFERS ANNUAL MEETING

Because of improving business in its industry, Porcelain Enamel institute has deferred its eighth annual meeting and sales conference, originally scheduled to be held in Hotel Statler, Cleveland, Oct. 25-26, until Nov. 16-17 at the same place. If improvement noted at this time continues, the executive committee states, the middle of November should see many branches of the industry operating at a favorable rate. Plans for promoting a greatly increased business volume apparent for 1939 will be discussed.

SAE ANNOUNCES SPEAKER FOR ITS DINNER NOV. 14

H. W. Prentis Jr., president, Armstrong Cork Co., Lancaster, Pa., will be principal speaker at the annual dinner of the Society of Automotive Engineers, in New York, Nov. 14, during the society's national transportation and engineering meeting, Nov. 14-16. The dinner will be in Commodore hotel and the meeting in Hotel New Yorker.

Mr. Prentis, who is a director, National Industrial Conference board, regional vice president, National Association of Manufacturers, and a director, United States Chamber of Commerce, will speak on "Patriotism and Sound Business Practice."

BRITISH INSTITUTES WILL HOLD MEETINGS IN LONDON

To replace the joint meeting which was to have been held in New York, Oct. 3-4, the British Iron and Steel institute and Institute of Metals will conduct separate autumn meetings in London, the former on Oct. 26 and the latter on Oct. 27.

C. R. HOOK WILL ADDRESS FARM EQUIPMENT MAKERS

Charles R. Hook, president, American Rolling Mill Co., Middletown, O., and president, National Association of Manufacturers, will be one of the principal speakers at the forty-fifth annual convention of the Farm Equipment institute at French Lick, Ind., Oct. 17-19. The institute's membership is composed of manufacturers of farm implements.

Three Foundries Unite Sales Engineering Forces

■ Three noncompetitive foundries in the Milwaukee district have merged sales engineering forces in the interest of a more aggressive sales policy. Co-operating are The Liberty Foundry Inc., Wauwatosa, Wis.; Spring City Foundry Co., Waukesha, Wis.; and the Milwaukee Steel Foundry Co., Milwaukee.

William J. Grede

Research, technical and production facilities of all three are made available to customers through one channel.

William J. Grede is president of the Liberty and Spring City companies and chairman, Milwaukee Steel Foundry. Other officers include: B. C. Wait, president, Milwaukee Steel Foundry; John W. Perry Jr., general sales manager; Arthur L. Grede, vice president, Milwaukee Steel Foundry and secretary, Spring City Foundry; H. P. Kreulen, vice president, Spring City Foundry; Ralph L. Lee, secretary-treasurer and general comptroller, the Liberty Foundry; O. E. Woehlke, superintendent, the Liberty Foundry; James J. Ewens, superintendent, Milwaukee Steel Foundry.

Plants Exchanged by Sheet & Tube, Mark

■ Youngstown Sheet & Tube Co., Youngstown, O., last week acquired from Clayton Mark & Co., Chicago, that company's entire business of manufacturing butt weld pipe and of marketing butt weld and lap weld pipe, except cut lengths and rigid conduit.

At the same time Sheet & Tube transferred to the Mark company its business of manufacturing forged steel unions and water well supplies, which previously had been conducted at Sheet & Tube's Evanston, Ill., plant.

The transaction involved the sale to the Mark company by Sheet & Tube of the latter's Evanston plant and acquisition by Sheet & Tube of the Mark company's butt weld pipe facilities. These will be consolidated with Sheet & Tube's facilities for manufacturing butt weld and lap weld pipe.

The Mark company will discontinue manufacturing butt weld pipe and selling butt weld and lap weld and will confine its manufacture to forged steel unions and water well supplies.

1938 Scrap Consumption Placed at 18,400,000 Tons

■ Domestic consumption of iron and steel scrap in 1938 is indicated at about 18,400,000 tons, of which 13,900,000 tons will be melted in open-hearth steel furnaces and 4,500,000 tons in blast furnaces and cupolas, it was estimated by E. C. Barringer, executive secretary, Institute of Scrap Iron and Steel, in an address before the Boston chapter.

By comparison, the official bureau of mines calculation of scrap consumption in 1937 was 28,300,000 tons in steel furnaces and 9,600,000 tons in iron furnaces.

If exports of scrap during the remainder of this year continue on the basis up to date, the foreign movement in 1938 should approximate 3,300,000 tons, as against 4,100,000 tons in 1937.

Steel's Safety Record: Accidents Reduced 90 Per Cent in 30 Years

■ FURTHER progress in industrial safety lies in the realm of individual responsibility and will be accomplished through sane industrial relations.

This was the keynote sounded at the Metals meeting in the National Safety council's silver jubilee congress, Chicago, Oct. 10-14.

"In the 30 years during which safety records have been kept in the steel industry, there has been a reduction in frequency of accidents of 90 per cent," said T. M. Girdler, chairman, Republic Steel Corp., and president, American Iron and Steel institute. "The result is that today steel stands close to the top of the list for safety among 30 leading industries."

Reviewing the history of steel's safety campaign, Mr. Girdler said: "It is to the lasting credit of the steel industry that it provided the leadership and the initiative in the safety movement. As early as 1907, the Association of Iron and Steel Engineers appointed a safety committee. Later, in 1912, that same association, at its meeting in Milwaukee, conducted the first co-operative safety congress and named a committee composed of industrial leaders and federal and state officials, 'to organize and guide a permanent body devoted to the promotion of safety to human life in the industries of the United States.'

"Out of the deliberations of that committee," continued Mr. Girdler, "the National Safety Council was born. And so the steel industry not only founded the National Safety council, but it financed the infant organization until it was well on its feet. All through the years it has continued its leadership in the safety movement, and today the Metals section is one of the most active of all the components of the council."

■ **Additional news of the steel and metalworking industries will be found on pages 94 and 95.**

Plant executives in the steel and metalworking industries reported to the convention on safety measures adopted in their mills, discussed problems and their solution, reviewed safety equipment now available.

Metals section executive committees for 1938-1939: General chairman, Mell E. Trammell, Republic Steel Corp., Alabama City, Ala.; vice chairman, N. J. Griffith, Jones & Laughlin Steel Corp., Pittsburgh; and secretary and news letter editor, Irvin A. Brinkman, Mackintosh-Hemphill Co., Pittsburgh.

Other committee chairmen: Contest, H. J. Spoerer, Youngstown Sheet & Tube Co., East Chicago, Ind.; engineering, R. H. Ferguson, Republic Steel Corp., Cleveland; foundry, J. A. Coltrin, National Radiator Corp., Johnstown, Pa.; health, Dr. A. G. Kammer, Inland Steel Co., East Chicago, Ind.; membership, H. H. Henry, Otis Steel Co., Cleveland; poster, Fred E. Warr, Carnegie-Illinois Steel Corp., Pittsburgh; program, John P. O'Rourk, Bethlehem Steel Co., Sparrows Point, Md.; publicity, Earl Fyler, Carnegie-Illinois Steel Corp., Chicago; railway car builders, P. J. Brand, Pullman-Standard Car Mfg. Co., Chicago; statistics, N. B. MacHose, Bethlehem Steel Co., Lackawanna, N. Y.; and fire prevention, W. T. Filmer, Youngstown Sheet & Tube Co., Youngstown, O.

Members-at-large: C. M. Allen, American Rolling Mill Co., Middletown, O.; F. G. Bennett, Buckeye Steel Castings Co., Columbus, O.; R. A. Beyer, Central Tube Co., Ambridge, Pa.; C. A. Bianchi, H. H. Robertson Co., Ambridge, Pa.; E. F. Blank, Jones & Laughlin Steel Corp., Pittsburgh; R. A. Chaffin, Continental Steel Corp., Kokomo, Ind.; H. M. Croghan, Inland Steel Co., East Chicago, Ind.; J. E. Culliney, Bethlehem Steel Co., Bethlehem, Pa.

H. W. Darr, Bethlehem Steel Co., Johnstown, Pa.; W. W. Dundore, Beloit Iron Works, Beloit, Wis.; B. T. Dye, Republic Steel Corp., Warren, O.; E. A. Ellis, Wheeling Steel Corp., Wheeling, W. Va.; J. P. Gatherum, Great Lakes Steel Corp., Ecorse, Mich.; E. E. Greene, Timken Roller Bearing Co., Canton, O.; S. E. Hawkes, MacWhyte Co., Kenosha, Wis.; H. G. Hensel, Youngstown Sheet & Tube Co., Chicago; W. A. Jarvis, Chase Brass & Copper Co. Inc., Waterbury, Conn.

F. A. Lauerman, Republic Steel Corp., Chicago; John P. Leonard, Blaw-Knox Co., Pittsburgh; E. H. Meeks, Transue & Williams Steel Forging Corp., Alliance, O.; D. V. Medalie, Interlake Iron Corp., Chicago; P. R. McMahon, Superior Steel Corp., Pittsburgh; C. S. Phillips, Revere Copper & Brass Co.; Pittsburgh; H. L. Rebrassier, Wheeling Steel Corp., Wheeling, W. Va.; H. L. Rogers, Sheffield Steel Corp., Kansas City, Mo.; Robert L. Schmitt, Louisville Car Wheel & Railway Supply Co., Louisville, Ky.; H. S. Simpson, Caterpillar Tractor Co., Peoria, Ill.; and J. A. Voss, Republic Steel Corp., Cleveland.

All-Welded Steel Barge "Can Take It"

■ **Wind and water raged even in sheltered New York harbor during the tropical hurricane Sept. 21. The freighter FAIRFIELD, 2848 gross tons, (right) broke from its moorings at 55th street pier, Bush Terminal, and charged with terrific force against the all-welded steel coal barge, ANDREW J. GUNNOUD, tied against the slip bulkhead. For three hours it alternately rammed the GUNNOUD and recoiled with the waves, striking it 38 blows. The GUNNOUD was dented, but did not open or ship water. Photo, Dravo Corp., Pittsburgh**

More Than 100 Entries In Heating Contest

■ More than 100 power sales engineers, representing utility companies in every section of the United States and Canada, entered papers in General Electric Co.'s industrial heating contest which closed Oct. 1. The contest, to promote industrial use of electric heat, offered seven prizes for papers dealing with successful electric heating installations. Prizes will be awarded early in December.

MEN OF INDUSTRY

■ W. A. MAXWELL JR. has been elected president, Colorado Fuel & Iron Corp., Denver. He succeeds Arthur Roeder, president since 1929, who has become chairman of the board. In his new post Mr. Roeder will have general supervision of the business and policies of the organization. Prior to joining the corporation in 1927, Mr. Maxwell had been general superintendent of Inland Steel Co., Chicago.

N. R. Orr, S. F. Pierson and L. F. Quigg have been named vice presidents, and T. Aurelius has been made manager of railroad sales.

♦

A. R. Clark retired Oct. 1 as superintendent of shops, Ensley and Fairfield, Ala., works of Tennessee Coal Iron & Railroad Co., due to ill health. He had occupied this position since Jan. 1, 1907. Prior to that he was associated with the Lackawanna Steel Co., Buffalo; Dominion Iron & Steel Co., Sydney, N. S.; Illinois Steel Co., Chicago, and the Newport News Shipbuilding Co., Newport News, Va.

♦

Irving H. Taylor, Detroit, has been appointed chief of the automotive-aeronautics trade division, bureau of foreign and domestic commerce, department of commerce.

♦

C. N. Kirkpatrick, secretary and sales manager, Landis Machine Co. Inc., Waynesboro, Pa., sailed Oct. 8 to visit the company's representatives in England and on the Continent.

♦

E. M. Fieger has been named construction engineer, and J. K. Devitt chief civil engineer of Gary works, Carnegie-Illinois Steel Corp. Mr. Fieger formerly was construction engineer of the new Irvin works at Clairton, Pa., and Mr. Devitt assistant chief civil engineer at Gary.

E. M. Fieger

A. R. Clark

Mr. Fieger began his service with United States Steel Corp. subsidiaries in 1903 as a mechanical draftsman with the former American Sheet & Tin Plate Co., Pittsburgh. Mr. Devitt began as an engineer with Shenago Furnace Co. in 1906.

♦

Charles W. Hatch, associated with Jones & Laughlin Steel Corp. since 1909, has been appointed engineering chief draftsman of the Pittsburg, Calif., plant of Columbia Steel Co.

♦

Yale D. Hills has been made manager of distributor sales for the service-sales division, Timken Roller Bearing Co., Canton, O. He formerly was manager of the Los Angeles branch of the company. His headquarters will be in Canton.

♦

C. T. Geuthing, heretofore sales engineer, Heald Machine Co., Worcester, Mass., will take charge of the company's Detroit sales office Nov. 1, and Robert M. Lippard, formerly manager at Detroit, will return to Worcester.

♦

Kirke W. Connor, president, Micromatic Hone Corp., Detroit, sailed Oct. 6 for a European trip, having been invited to address several engineering societies on methods of surface finish processing, comprising design and production personnel in the aircraft, automobile and ordnance manufacturing industries. He will visit England, France, Holland, Germany, Sweden and Russia.

♦

Charles E. McIntyre, heretofore assistant to manager of sales, has been appointed assistant sales manager, Cleveland district sales office of Carnegie-Illinois Steel Corp. Mr. McIntyre began his career with the corporation as an office boy in 1917.

♦

A. M. MacCutcheon, engineering vice president, Reliance Electric & Engineering Co., Cleveland, sailed Oct. 15 for a nine-week business trip abroad. He will visit leading European manufacturers of electric power equipment to study recent developments in design and manufacturing.

♦

V. J. Hydar, for many years director of employment, Falk Corp., Milwaukee, has resigned to become senior field representative of the federal committee on apprenticeship training. He will contact employer and labor groups to promote adoption of national standards of apprenticeship in the metal trades industries.

♦

Harry W. Smith Jr. has been named director of industrial gas publicity, industrial gas section, American Gas association, New York. A graduate of Case School of Applied Science and Princeton university, Mr. Smith has served the association for five years at both its Cleveland and Los Angeles testing laboratories, and was with the New Jersey Zinc Co. two years.

♦

James M. Woltz, for many years safety director and more recently supervisor of plant police for Youngstown Sheet & Tube Co., Youngstown, O., has retired after 25 years' service. Mr. Woltz was one of the organizers of the National Safety council, Chicago.

Vernon J. Crouse, for many years a member of Sheet & Tube safety forces, has been named successor to Mr. Woltz.

♦

Frank J. Carr, heretofore assistant to president, American Steel & Wire Co., Cleveland, has been appointed comptroller. Mr. Carr has been associated with the company since last march. In the four pre-

J. K. Devitt

ceding years he was comptroller, Tennessee Valley Authority, Knoxville, Tenn., and prior to that was comptroller, Aviation Corp., after having held a similar position with Hahn department stores.

♦

Karl M. Wise has been appointed director of engineering, Bendix Products division, Bendix Aviation Corp., South Bend, Ind. Mr. Wise was for six years director of engineering for Pierce Arrow Motor Car Co., prior to becoming associated with the Bendix organization as vice president of Marshall Asbestos, a Bendix subsidiary, and technical advisor to Bendix Aviation Corp., and later as assistant director of engineering for the Bendix Products division.

♦

John R. Johnston, manager of sales, Milwaukee district sales office, Carnegie-Illinois Steel Corp.,

J. R. Johnston

has been appointed assistant manager of sales, Chicago district sales office.

Upon graduation from the University of Illinois in 1925, Mr. Johnston started his business career as a member of the training school at Gary steelworks, after which he was transferred to the rail bureau in the general sales department at Chcago, later becoming chief clerk of the bureau. He was transferred to the Chicago district sales office in June, 1929, as a salesman, serving there in various capacities until his appointment as manager of sales at Milwaukee in 1935.

♦

William P. Woodside, vice president, Climax Molybdenum Co. of Michigan, and chairman, Detroit chapter, American Society for Metals, was presented with a medal by the chapter at a recent meeting of 250 of its members in Ann Arbor, Mich., in recognition of the fact that he was one of the founders of the chapter 25 years ago. Mr. Woodside

Karl M. Wise

also is national vice president and nominee for president of the society.

♦

Wallace K. Brown has been appointed vice president and general sales manager, Crocker Wheeler Electric Mfg. Co., Ampere, N. J. Educated at Clarkson Tech and the University of Illinois, Mr. Brown started with the Crocker organization as an engineering apprentice and later was in the Chicago, San Francisco and New York sales offices. D. B. Christian, vice president and formerly general sales manager, will continue in an administrative capacity.

♦

Fred V. Gardner has been elected acting treasurer, Chain Belt Co., Milwaukee. He succeeds the late C. L. Pfeifer. Associated with the company since early this year in a consulting capacity, Mr. Gardner formerly was affiliated with General Electric Co., Schenectady, N. Y., as supervisor of budgets.

John T. Brown, vice president, has been named to the board of directors; G. M. Dyke, assistant treasurer, has been re-elected to that post, and A. F. Kessler, chief accountant, has been made an assistant treasurer.

F. V. Gardner

DIED:

■ WILLIAM E. JEANNOT, 72, former president, West Michigan Steel Foundry Co. and president, Eagle Foundry & Machine Co., in Muskegon, Mich., Oct. 4.

♦

Robert S. Jones, 67, president, Clyde Cutlery Co., Clyde, O., in that city, recently.

♦

Charles C. Cochran, 56, stationary engineer for Republic Steel Corp., Youngstown, O., in that city, Oct. 7.

♦

Ross Hatton, 58, master mechanic, Torrance, Calif., plant, Columbia Steel Co., the past ten years, in that city, recently.

♦

S. F. Bowser, 83, at his home in Fort Wayne, Ind., Oct. 3. He founded the S. F. Bowser Pump & Tank Co., Fort Wayne, and invented and commercialized a self-measuring gasoline pump.

♦

William J. Brown, 67, Oct. 5 in Cleveland. He formerly was superintendent, bessemer department, American Steel & Wire Co., Cleveland. He had been with the company 52 years, retiring several months ago due to ill health.

♦

Roy Shuman, 71, Oct. 3 at his home in Florida. He was active many years in the publication and advertising field, having served as advertising manager for International Harvester Co., and Joseph T. Ryerson & Sons, Chicago.

♦

Bert Arthur Linderman, 67, inventor and head of several engineering companies, Oct. 8 in New York. He was chairman of the board, Muskegon Machine Co. Inc., Newburgh, N. Y., and president of Canadian Linderman Co. Ltd. and Linderman Devices Ltd., both of Woodstock, Ont.

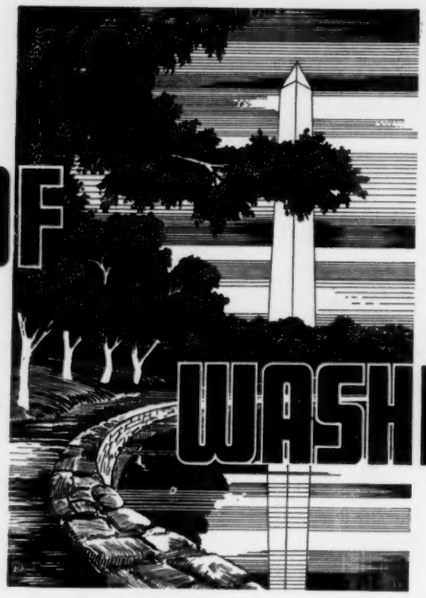
♦

Charles A. Cahill Sr., 77, Oct. 5. He was head of Charles A. Cahill & Sons, Milwaukee, consulting engineers. He specialized in steam power plant design, construction and operation. Mr. Cahill was a past chairman, Milwaukee section, American Society of Mechanical Engineers.

♦

John J. McQuillen, formerly Pittsburgh district sales manager, Morgan Engineering Co., Alliance, O., in Corning, N. Y., Sept. 28. He joined the Morgan company in 1889. On May 1, 1900, he was made Pittsburgh district manager, holding that position until his retirement in November, 1934.

WINDOWS OF WASHINGTON



BY L. M. LAMM

Washington Editor, STEEL

WASHINGTON

■ NATIONAL economic committee will begin hearings in its monopoly investigation Nov. 14, it announced last week. Eighty-nine subpoenas have been issued in the glass industry.

Considerable difference of opinion has developed in the committee—among members themselves and some of the experts. Work has been proceeding slower than expected.

An executive in charge of the monopoly work in one of the government departments told the writer last week that while his department was supposed to be further along with its work than any of the other government agencies, he was much discouraged by the lack of progress.

Wants General Picture

The government experts are making an earnest effort to find out what the investigation is all about before they really begin their job. It is reported Senator O'Mahoney, who heads the committee, believes cases pending in the department of justice and the federal trade commission should be left out of the investigation. He thinks, it is said, the committee should first get a general picture of business, but in that regard he is thinking differently from some of the other members.

As part of the outcome of the work of the economic committee, there is a feeling that eventually a bureau of industrial economics will be evolved which will approximate for industry what the bureau of agricultural economics of the department of agriculture does for the farmer. This is not a new suggestion as Secretary of Commerce Roper has several times tried to get an appropriation for this bureau, but without result. It was also mentioned last winter by the President in one of his messages to congress, but at that time he indicated that it should be located in the federal trade commission and not in the department of commerce.

ANDREWS PUTS FIVE JOBS UNDER WAGE-HOUR LAW

Elmer F. Andrews, wage-hour administrator, last week announced the wage-hour law would apply to maintenance workers, watchmen, clerks, stenographers, and messengers.

In his first interpretive bulletin concerning general application of the law Andrews said these types of workers must be considered as engaged in processes or occupations "necessary to the production" of goods moving in interstate commerce.

Mr. Andrews also issued regulations governing the employment of learners, apprentices, handicapped persons and messengers at rates less than the 25 cents an hour required by the fair labor standards act.

Discussing the set-up of his regional offices and the appointment of directors last week, Mr. Andrews said "as regional directors are appointed every effort will be made to have them in the field as promptly as possible. However, all field jobs are being filled under civil service requirements and some delay is inevitable.

"Regional directors, as appointed, will be brought to Washington for preliminary training. It is expected that when these officers are in operation all complaints of noncompliance with the law, requests for information and interpretations can be handled in the field where the regional staff will be familiar with local problems."

Literally, thousands of inquiries are being received by the division from trade associations and firms, but it has been announced that answers to particular situations will have to be delayed.

Mr. Andrews believes, he has stated, several times at press conferences, it is his duty to issue rules and regulations of various sorts under the law that this is "more immediately pressing" than the answering of individual inquiries. It is fully expected these rules will be issued before Oct. 24.

DEFENSE STUDIES HOLD UP PRESIDENT'S BUDGET PLANS

Administration budget plans have been held up pending new national defense studies, the President indicated last Friday.

The studies are being made at Mr. Roosevelt's request on new developments and mass production, partly as a result of recent information received by this government.

The President refused to go into details of the defense study, stating he wanted the public to get the whole picture at one time. He said the matter will be laid before congress when it convenes.

NEWSPAPERMEN SEE HOW LABOR BOARD OPERATES

Washington newspaper correspondents last week got a close-up view of the workings of the CIO and the national labor relations board. The largest, and probably best known, newspaper club in the world is located in this city—the National Press Club.

The club has prided itself for many years on the fact no tipping is allowed, and, therefore, the waiters, cooks and other employes, of which there are more than 50, receive higher than ordinary wages.

Some weeks ago CIO organizers

WASHBURN
FLAT COLD ROLLED
6" AND NARROWER STRIP
It takes a thorough knowledge of heat treating and tempering combined with exceptional care throughout operations to produce flat cold rolled strip with these high qualities.
Washburn's modern facilities and nearly a century of precision wire craftsmanship are responsible for uniformity in temper and thickness. Straightness throughout the coil. No variations in quality from shipment to shipment. Freedom from defects on surfaces or edges.
Washburn Flat Cold Rolled Strip is available in widths from 6" to 1/16", thicknesses from .004 to .125 and bright, galvanized, tinned and cadmium finishes.
WASHBURN WIRE CO., PHILLIPSDALE, R. I.
WASHBURN WIRE CO., Inc., NEW YORK CITY
WASHBURN
CLEAN, UNIFORM BILLETS — STRIP — RECTANGULAR, ROUND, FLAT RODS
TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES

made an effort to have the Press Club employes join one of their unions. The upshot of the whole matter was that the national labor relations board ordered an election, to which no objection was made either by the members or the board of governors of the club.

In the meantime, CIO organizers went to the home of a number of waiters and other employes and are alleged to have told the wives that if these employes did not vote for joining the CIO they were quite likely to find their arms or legs broken and that they would be dismissed by the club.

CIO Loses

The board of governors of the club took the matter up with officials of the labor relations board, and were informed that they had no interest in what the CIO organizers were doing, but they would insist that the members of the club should make no kind of an argument against the employes joining the CIO.

There is nothing unusual in this situation in as far as industrialists are concerned because they have been up against a similar situation for a long time. However, it came forcibly to the attention of the Washington correspondents, and there has been much talk among those who have up to this time been favorable to the national labor relations board.

There is no question but what this will have its repercussion in stories emanating from Washington relating to labor matters. The matter was solved for the Press Club, however, by the fact that the employes voted against joining the CIO unions.

SUPREME COURT GRANTS FORD'S APPEAL FOR REVIEW

Last week the United States Supreme Court granted an appeal of the Ford Motor Co. for review of a decision of the sixth circuit court permitting the national labor relations board to reopen the unfair labor practices case against the company.

The question of the labor board's right to withdraw an order was raised by the Ford company which had been directed by the board to reinstate a number of employes and to cease interfering with the self-organization of its workmen.

The board sought to withdraw the order after the Supreme Court, in the Kansas City stockyards case, had indicated there was a possibility the procedure followed by the board had not met the requirements of due process of law. The Ford company appealed to the Supreme Court after the circuit court at Covington, Ky., had ruled the board be permitted to withdraw its order.

Withdrawal of a similar order against the Republic Steel Corp. was authorized by the Supreme Court last May, but in that case a transcript of the record had not been filed with the circuit court, while such a transcript was filed in the Ford case.

Doubt whether a worker who strikes in violation of a contract retains his status as an employe grew out of labor proceedings against the Columbian Enameling & Stamping Co., Terre Haute, Ind.

The board lost the Columbian case before the circuit court at Chicago, which held, despite a board order to the contrary, that the striking employes completely severed the employment relations because they had struck in violation of a contract, and thereby ended all obligation of the company to bargain with union representatives. The board had held the refusal to bargain after the strike was an unfair labor practice and had ordered the reinstatement of 250 strikers.

The circuit court said the company had engaged in "an open, defiant flouting of the law," but that the employes, because of their own action, were barred from obtaining relief under the Wagner act.

GERMANY WANTS MORE FAVORABLE TRADE PACT

There have been a number of stories emanating from Germany recently to the effect that country desires to make more favorable trade arrangements with the United States. Sumner Welles, acting secretary of state, said last week this country will welcome a restoration of normal trade relations with both Germany and Italy, but such a step can take place only on the basis of America's reciprocal trade policy. No communication has been received by this government, Welles said, on this subject recently.

His statement was interpreted as clearly indicating that if Germany, which is now on this country's trade "black list" because of discriminatory practices, wishes to restore normal trade relations it must reverse its present policy of unilateral barter with "aski" paper marks and stringent monetary restrictions. The United States is not prepared, he flatly stated, to change its reciprocal trade policy of most-favored-nation treatment on a multilateral basis, which is diametrically opposed to Germany's policy.

CONSTRUCTION CONFERENCE TO BE HELD OCT. 20-21

Plans have been completed by the United States Chamber of Commerce for the construction industry conference to be held here Oct. 20-21. Main problems to come before the conference is that of the disproportionate increase of public as against private construction.

The conference, called by the chamber's construction and civic development department in co-operation with the Construction League of the United States and with national trade associations in the construction field, will devote itself to the stimulation of private construction work.

Helped Residential Building

It will be the first general meeting of all sections of the construction industry held in recent years. Last fall the chamber, in co-operation with trade associations in the building industry, held a conference on local residential construction. This, the industry holds, contributed materially to encouraging private residential building, as shown by the fact that whereas the summer and early fall of 1937 was a period of declining volume this summer and fall has been a period of increasing volume. The 1937 decline has been reversed and a continued improvement of business in this field is expected.

On the basis of this experience it seemed desirable to leaders in the construction industry to arrange for a broader conference this fall, covering the entire construction industry. The program of the conference has been arranged to afford an opportunity to examine the potential market for new construction work and the opportunities it affords for the employment of men and private capital.

Among the subjects chosen for consideration by the conference are these: Opportunities for employment of men and capital in construction work; a general policy for the construction industry; construction values; small homes; promotional plans of material and equipment producers; local efforts to stimulate residential building; modernization; the government and construction; rebuilding blighted areas; financing industrial construction; and financing home construction.

ANNOUNCES TURNPIKE FINANCING ARRANGEMENT

Jesse Jones, RFC chairman, announced last week that arrangements had been made between his organization, the PWA, and the Pennsylvania turnpike commission covering the purchase by the RFC of $39,000,000 worth of Pennsylvania revenue bonds and a grant by PWA of $26,100,000.

The proceeds of the loan and grant are to be used in the construction of a 162-mile, 4-lane super-highway with low grades and easy curves through the mountains from a point near Harrisburg to a point near Pittsburgh (STEEL, Sept. 26, p. 29.)

No War Clouds For Foundrymen

■ **London**—(*By Mail*)—International Foundry congress was held in Poland, Sept. 8-17 under unusual circumstances. From the time delegates from 15 countries assembled in Warsaw until they left Krakow ten days later, war clouds were gathering ominously over Europe. Notwithstanding the presence of representatives from countries directly affected, the meeting was held in an atmosphere of good fellowship and esteem.

It was remarked frequently that if international political affairs were conducted between peoples and statesmen in the same spirit the paths of nations would be smoother. Countries represented by delegates: Australia, Belgium, Czechoslovakia, Danzig, France, Germany, Great Britain, Holland, Hungary, Italy, Luxemburg, Roumania, South Africa, Switzerland and the United States.

The congress was a model of organization, remarkable since the Polish Foundry Technical association has existed only a few years and practically the whole of the industry has been re-created in the last 20 years. Technical sessions were begun in Warsaw and concluded in Krakow, the last stop in an extensive tour of the country's foundries and industrial plants.

In convening the congress, Prof. K. Gierdziejewski, president of the Polish association, and organizer of the event, stated that Poland has about 425 foundries, including 231 for gray iron, 12 for malleable, 23 for steel, and a large number for nonferrous. Production of iron castings in 1937 was 175,000 tons. The industry gives employment to 16,000 men, and the foundries are chiefly attached to large units, such as iron and steel or engineering works.

At a meeting of the International Committee for Testing Cast Iron, J. E. Hurst, past president of the Institute of British Foundrymen, was elected active president for three years, succeeding J. Leonard, immediate past president of the Association Technique de Fonderie of Belgium. Prof. A. Portevin of England remains general president in charge of the general policy committee for three years.

Italian Heads Chief Committee

Dr. Guido Vanzetti, president of the foundry section of Federazione Nazionale Fascista degli Industriali Meccanici e Metallurgici, and managing director of Fonderia Milanese di Acciaio Vanzetti, Milano, was elected president of the International Committee of Foundry Technical Associations to succeed Dr. Paul Schwietzke, president, Technischer Hauptausschus fur Giessereiwesen, Germany.

The International committee was formally invited to hold the Seventh World Foundry congress in London in June, 1939. It was decided to hold an international congress in Italy in 1940, and one in Holland in 1941.

On behalf of the American Foundrymen's association, its European delegate, Vincent Delport, European manager of STEEL, London, invited the committee to hold a world congress in the United States in 1942—a proposal which was accepted.

Modern Home for J & L Wire Rope Division

■ **This new plant at Muncy, Pa., houses the recently established Gilmore wire rope division of Jones & Laughlin Steel Corp., Pittsburgh. Latest type of equipment is producing wire rope for general construction, industrial and oil country use. The division is expected to provide outlet for products of the rod and wire mills of the parent company. It is under direction of Robert Gilmore as general manager**

Transformation In 25 Years

■ IF A STEELMAKER "Rip Van Winkle" were returning to his job today after a 25-year sleep, he would find research and engineering had so transformed manufacturing processes as to make the modern steel mill appear a land-of-make-believe.

"He would find himself embarrassed by his lack of understanding of the changes wrought in this basic industry in the past quarter century," Dr. Rufus E. Zimmerman, research vice president, United States Steel Corp., told the Robert Morris Associates at Hershey, Pa., last week. Dr. Zimmerman spoke on "Insuring Investment Through Research."

"In an age characterized by rapid change and development, and in which progress and obsolescence are necessarily abroad at the same time, investment remains investment only if it is associated with enterprises which are in step with the forward procession," he said.

Over a Century of Progress

"Science and research did not come upon industry suddenly. For approximately a century prior to 1900 there was a slow process of becoming acquainted—on occasions only—during a period high-lighted by important inventions, scientific discoveries, and a gradual increase in productive capacity. The growing acquaintance proved mutually advantageous in so many ways, and the build-up soon became so rapid, that during this twentieth century organized research was adopted as an integral part of almost every kind of business.

"While research effort is not to be measured simply in terms of the number and size of laboratories in existence, it is interesting to note that there are in this country more than 1600 proprietary laboratories concerned with the scientific and technological aspects of industry. Of the total number, approximately three-fourths were established since the close of the World war, and it is estimated that the complement of men exceeds 30,000.

"The American public, generally, has been enabled to purchase an impressive variety of goods at prices well within its reach, and the American worker can buy, with his wages, several times as much as his correspondent in any foreign country.

"A glance at the parking lots adjacent to the factories throughout this country, in comparison with those to be found almost anywhere in Europe, tells a story which is in harmony with this thought."

What makes Main Street?

Streets, People, Homes, Goods, Factories, Tools make Main Street.

Main Street moves forward as human relationships—out of which is created the desire to *make* and the desire to *have*—move forward.

Men understand these elements individually. We know, for instance, how to make good tools. We have not hesitated to improve their design—adding to their usefulness—immensely broadening the scope of the tool.

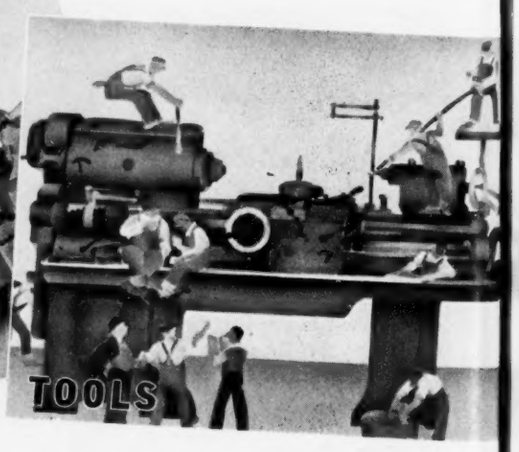
Can it be that the next ten years will witness like improvements in the relationships between men and men and men and industry?

The patterns are being drafted out of which these changes will come. They are not perfect in design or practise. But the same desire which actuated the betterment of industrial production—applied to the balancing of human understanding—must eventually succeed.

When this comes, and it *will come*—Main Street, which is the energy center of all human relationships—will move forward to greater heights than it has ever known.

This is the task. Let all who have helped to make industry *great*—now bend their efforts to make it—*understandable*.

An editorial by The R. K. LeBlond Machine Tool Company, Cincinnati, O.



"What Makes Main Street" so far as LeBlond Tools are concerned is now in its third printing. Every executive should have a copy in his library. Send for your copy today.

MIRRORS OF MOTORDOM

DETROIT

■ UPWARD swing in automobile production is continuing according to schedule and the thousands returning to jobs on assembly lines make good copy for newspaper headlines. Employment lists at Chevrolet and Ford currently are being stepped up rapidly and as these two large producers move into their customary assembly speed the industry is regaining more fully its normal complexion.

If the experience of Olds and Buick is any criterion, producers are going to encounter spirited demand for new models in the next few months at least. For example, retail orders signed by Buick dealers are the highest they have been for any announcement period in the last ten years. Deliveries of new cars in the last ten days of September totaled 5057, compared with 4425 in the same period last year, a 14 per cent improvement.

Olds dealers already have experienced a similar reaction from the field, and the Olds plant last week went on two shifts, a procedure which Buick put into effect a week or so previous. The past week saw practically all car builders back into 1939 model production, with the exception of Hupmobile and Willys. After weeks of delay occasioned by labor disputes, Nash finally went into action last Tuesday and new models are now rolling to dealers.

Throughout the industry, however, labor remains a critical question mark. Already there have been interruptions at Chrysler plants, and a strike vote at Buick was narrowly averted about a week ago. Last Wednesday, Motor Products, important supplier for Chrysler and Ford, was the scene of a disturbance as a strike was called and about 2000 men stopped work. The management stated no reason had been offered for the strike, while Homer Martin, UAW president, declared he had authorized the walkout after attempts to arrange negotiations with the management had failed. He added that lowering of wage rates and arguments over seniority were at the bottom of the trouble.

BY A. H. ALLEN
Detroit Editor, STEEL

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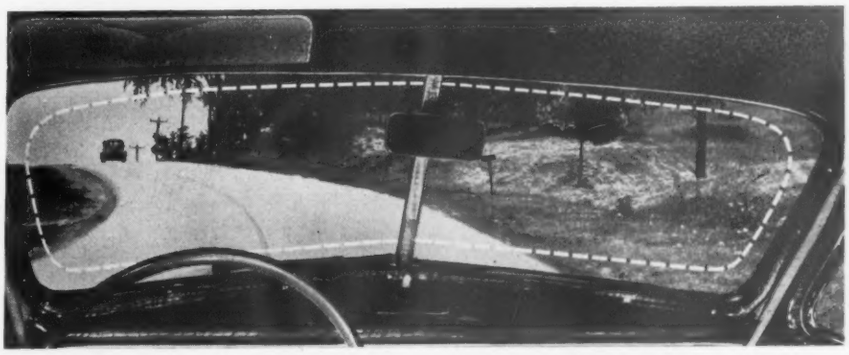
UAW Pushing 32-Hour Week

For the time being the UAW appears to have consolidated its ranks, reinstating ousted officers, and is now bending efforts toward selling the idea of the 32-hour week as a means of stepping up employment. Conferences are being held with both Chrysler and General Motors managements over the 4-day week problem, with no decisions announced as yet. There is considerable question over whether the rank and file of union membership really wants the short week, because of its curtailing effect on earnings. Early this year when the short week was tried as a means of spreading employment, it finally had to be abandoned because it demoralized plant efficiency and reduced the weekly earnings of those still at work to the point where they could barely eke out a living.

As an example of worker opinion on the matter, when Plymouth workmen refused to remain at their jobs on Friday of two past weeks, it meant a shutdown at the Briggs body plant. Immediately a protest was made by union representatives at Briggs, so managements were treated to the picture of one group of men insisting on working only 32 hours a week and another group protesting that this policy meant mass starvation.

From a publicity standpoint, the brief conference last week between Homer Martin and Harry Bennett,

Larger Area of Vision in New Windshields



■ **Steel recedes to glass for better vision in windshields and windows of new car models. Here is a comparison of the old and the new in Pontiac windshields, the new design showing 26 per cent more glass area by virtue of increased height and width of opening, lower cowl line and narrower corner posts**

Ford Motor Co. personnel chief, probably reacted to Ford's benefit, although reportedly the conference was requested by Martin. Anyway, he conferred with Bennett, met Mr. Ford and lunched at the Ford administration building. Subject of the discussion was said to be the 32-hour week as an industry-wide proposition, but it is a good bet that Bennett and Martin examined at least briefly the situation at Motor Products, since the latter supplies a large volume of parts to Ford. But since the strike was called immediately following the conference, it is apparent no definite conclusions were reached.

In the course of the discussion, Mr. Bennett made it plain that Ford would never sign a contract with any labor organization, although he was perfectly willing at any time to sit with responsible labor leaders and discuss generalities.

■ WHILE considerable stir was made in newspapers over the $4 per ton reduction in hot-rolled and cold-rolled sheet and strip, it was really no news in Detroit; in fact, there appears little question that most of the automotive steel tonnage placed thus far has taken the new price.

The price of sheet steel, delivered in Detroit to auto companies, is now down around $55, which is approaching the low 1933 level of $50.83.

Steelmakers are unanimous in deploring the effects of this action, but most of them declare they were powerless to combat it, at the same time expressing hope that some corrective move can be taken.

Obviously the new price is not going to stimulate any automotive steel buying, but it may serve to expand purchasing in other consuming fields. Steel purchases of auto companies are going to be gaged closely by actual production requirements, and if car sales at the coming automobile shows are good, then a continued upward movement in steel buying is a foregone conclusion regardless of price movement. Retail car prices have been established, and it is probable that the current reduction in flat-rolled steel already has been figured in.

■ FROM the new car data sheet: Cadillac and LaSalle models will be available either with or without running boards. Bodies follow the Fisher trend toward more glass area. Gearshifts all will be on the steering column. Chrome-plated window frames are used on the LaSalle. New geometry in rear spring suspensioin relocates ends of leaf springs higher and inside the frame to give a better ride by minimizing rear axle "hopping." Piston rings and valve tappets are treated by the Ferrox process (heating in oxidizing atmosphere) to reduce initial scuffing and wear.

Hudson has sung requiems for the Terraplane and in 1939 is offering three series of models—the 112, a Hudson 6, and the Hudson Country Club sixes and eights. Upholstery features a layer of a new sponge-like rubber latex over the springs, which is claimed to provide improved comfort. A sway bar has been added to the front end suspension for increased rigidity. Hood latches are under the dashboards—an ingenious safety feature. On the Country Club series, parking lights have been worked into the design of the hood louvers. Price reductions range up to $112.

De Soto bodies are 4½ inches wider across the front compartment than last year. Front-end design is patterned after the base motif used by all Chrysler Corp. cars this year, with die cast horizontal bars in the center grille and also in the catwalk grilles. Bodies are entirely new, featuring the sloping back and low-hung appearance.

Pontiac is showing two sixes and an eight for 1939, engines in the sixes being identical except for minor differences in crankshaft and connecting rods and other incidentals. Hoods have been changed to the alligator type, with radiator ornament serving as locking handle. Front seat frames are of steel tubing for lightness and strength. Lower floors in bodies have required the adoption of a new hypoid gear rear axle. The single-diaphragm type of clutch, introduced last year by Chevrolet, has been adopted by Pontiac, confirming earlier predictions made here. Muffler shells are of corrosion-resisting terne plate.

■ LACK of major motor changes in new models has reacted unfavorably on equipment interests supplying the automobile industry. One company building large machine tools reports its business so far this year only one-third last year's volume in the Detroit area. As yet there are no definite prospects that any sweeping changes are being proposed in power plants which might call for extensive re-equipment. But there is a very real desire on the part of all manufacturers to devise means to cut costs by improving mechanization, and as long as the equipment companies can come up with new ideas in tooling to save on production costs, they will have business.

As one machine tool expert put it, what the motor companies really would like is a machine in which a casting can be placed at one end and a completed engine emerges from the other.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,186	227,130
Feb.	300,810	383,900	202,589
March	438,943	519,022	238,598
April	527,625	553,231	238,133
May	480,518	540,377	210,183
June	469,368	521,153	189,399
July	451,206	456,909	150,444
Aug.	275,934	405,072	96,936
8 mos.	3,321,648	3,778,850	1,553,412
Sept.	139,820	175,630	*90,000
Oct.	230,049	337,979	.....
Nov.	405,799	376,629	.....
Dec.	518,958	347,349	.....
Year	4,616,274	5,015,974	.....

* Estimated.

Estimated by *Ward's Reports.*

Week ended	
Sept. 17	16,100
Sept. 24	20,390
Oct. 1	25,405
Oct. 8	37,665
Oct. 15	50,540

	Week ended Oct. 15	Oct. 8
General Motors	27,525	17,330
Chrysler	11,000	10.900
Ford	4,075	2,115
All others	7,940	7,320

Federal Machine & Welder Buys Roth Welding Co.

■ Federal Machine & Welder Co., Warren, O., manufacturer of spot, butt, flash and steam welders, flash strippers and other equipment, has acquired the Roth Welding Engineering Co., Detroit. The Roth plant at 17146 Mt. Elliott avenue, Detroit, is being operated as a branch of the Federal company, with O. N. Wanger as manager. Detroit sales office is at 710 Fisher building.

The Roth company owned United States patent No. 1,754,948 and had developed the Ultra-Speed spot welder. This device requires small transformer capacity and produces 10 to 20 spot welds per second, depending on the number of electrodes. It has wide use in welding steel stampings.

Taylor-Winfield Corp., Warren, O., and Thomson-Gibb Electric Welding Co., Lynn, Mass., are licensed to use this patent and the Federal company was also a licensee previous to its purchase of the Roth company.

■ Orders received by General Electric Co. during the third quarter amounted to $60,533,135, compared with $88,010,937 in the same quarter last year, a decrease of 31 per cent, President Gerard Swope announced. For the first nine months this year orders amounted to $188,756,958, or 38 per cent less than $305,276,556 in the period a year ago.

IF YOU CAN'T GET TO THE SHOW

IF you are coming to the National Metal Exposition this year—fine! We will look forward to a visit with you in our booth—B-106. But just in case you are going to be among the stay-at-homes, we have featured, on this page, just four of the hundreds of interesting die casting applications we will have on display.

Each of these four applications illustrates an outstanding quality of ZINC Alloy Die Castings—strength—accuracy—complexity—economy.

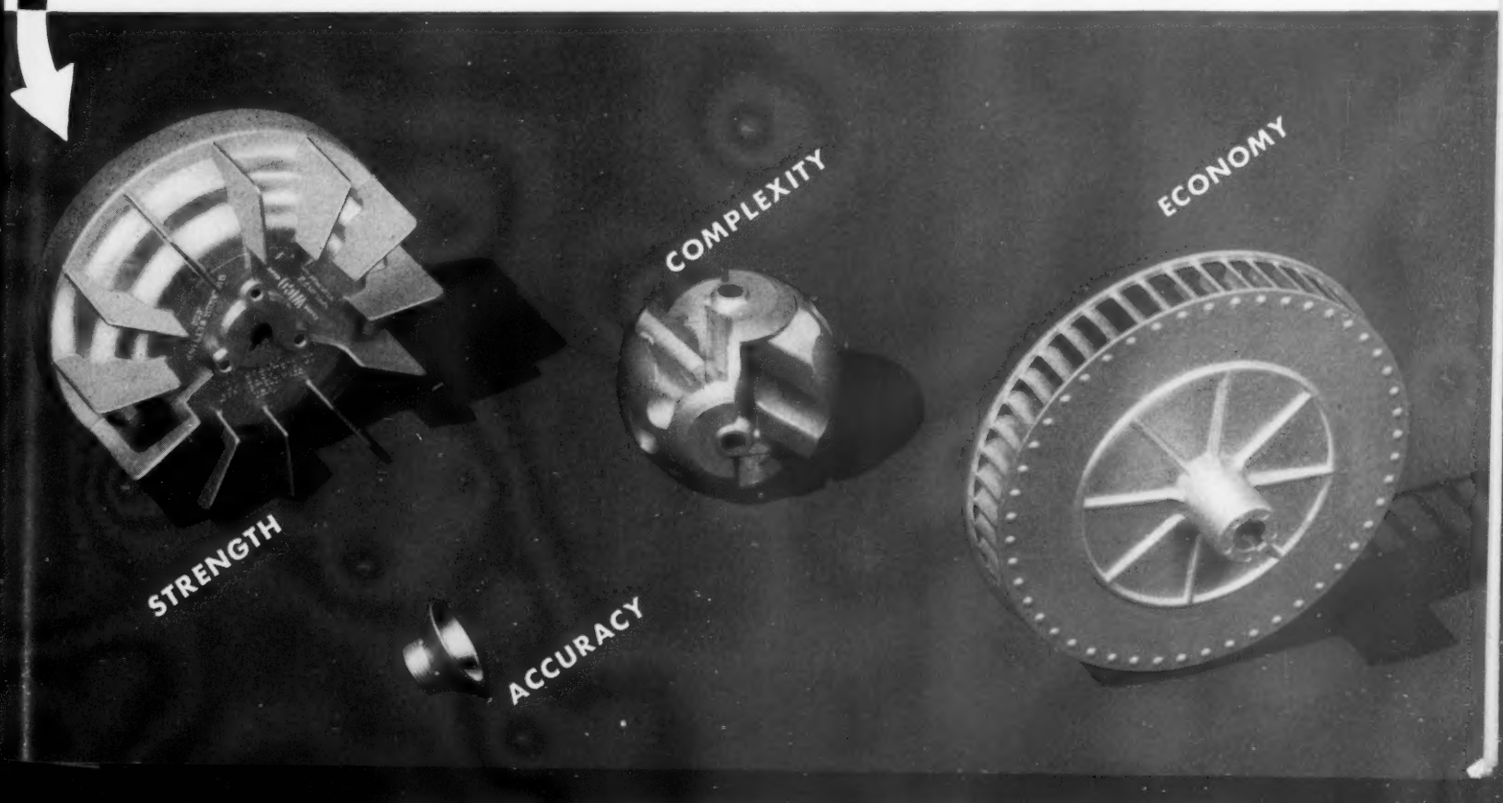
STRENGTH—Every engineer can visualize the strength requirements of an outboard motor flywheel. Exhaustive tests have determined that the die cast wheel shown here will reach 13,000 R. P. M. before bursting. This figure exceeds, by a wide margin, the highest runaway speed in service.

ACCURACY—An efficient flashlight reflector must have a true parabolic reflecting surface, and the accuracy of the die casting process permanently secures this critical requirement.

COMPLEXITY—The complex design of the oil pump rotor was such that die casting was the *only* means of production—without prohibitive cost.

ECONOMY—The economies of the process have been illustrated many times, but we ask that you examine the cage type blower fan shown here—*it was die cast in one piece with ZINC Alloy.*

The surface has only been scratched in the far reaching possibilities of this remarkable metal and method. For additional information consult any commercial die caster—or write to The New Jersey Zinc Company, 160 Front Street, New York City.



EDITORIAL

The Sins of the Fathers

■ A HIGHLIGHT of the Theodore Roosevelt administration was the government's war against the land thieves. In his interesting book *American Secret Service Agent,* (published by Frederick A. Stokes Co., New York), Don Wilkie tells of exciting events in that fight. When the department of the interior wanted to know why and how huge parcels of the public domain were falling into the hands of "corporations," secret service agents soon obtained all manner of proof that hundreds of thousands of acres had been stolen through the dummy-entryman system. The fight was desperate, as revealed by Mr. Wilkie in describing an incident as follows:

Former Questionable Dealings Prejudice Public Opinion

"I want to tell about the murder of Joe Walker, as kindly a soul as ever lived, a brave man and one of the smartest operatives the service ever knew. It was suspected that a large coal company had tunneled from its own mine into government land and was removing coal and bringing it to the surface through the company's shafts. Walker, with Thomas J. Callaghan, Elmer Gorman and an engineer named Harper, taken along as an expert in mining matters, set out from Durango to investigate.

"They drove seventeen miles from the town, hitched their team in a ravine and prepared to descend a deserted air shaft to the suspected tunnels. As Walker was asthmatic and well along in years he was left above-ground. The others lowered themselves hand over hand into the darkness by a rope made fast to a railroad tie laid across the mouth of the shaft. Callaghan, Gorman and Harper explored conditions below, found as they expected that the government was being swindled, and returned to the base of the shaft by which they had entered the mine. To their horror they could see no daylight above. The opening had been shut off. The rope, cut at the knot that had bound it to the tie, lay at their feet.

"They drew lots to decide which man should attempt the climb, carrying the rope. Harper, the engineer, got the short straw and, using his knees and elbows for leverage, contrived to work his way to the top. There he tried to shove aside the timbers that had been piled across the opening. These suddenly gave way and a shower of earth and rock hurled him down the shaft. His collarbone was broken. Callaghan and Gorman now drew lots and this time Callaghan made the attempt. He succeeded and Harper was hauled to the surface. But, as each man reached the open, he became a target for cross-gunfire. It was impossible to dislodge the two attackers hidden in dwarf oaks on either side of the ravine. The three men could only crouch behind the bulkhead. And there before them, weltering in his own blood, lay old Joe Walker. At last the firing ceased and Callaghan mounted one of the horses and rode off barebacked for help. Halfway to town he met two fellow operatives driving madly. In their wagon were four pine coffins. They had heard that the hired assassins had bragged that they would hunt the hunters, and did not expect to find any of the four secret service men alive."

Ghosts of Past Misdeeds Blur Picture of Industry's Benefits

Then follows the really amazing conclusion. Although the secret service found conclusive evidence that two men of Durango were guilty of the crime, and although three trials were brought, one because of an attempt to murder a witness for the prosecution, it was impossible to obtain a conviction.

Much of our recent literature is characterized by similar revelations of the seamy side of business and the gross corruption it brought about in past years. Such misconduct has vitiated the story of industry, which, in the main, has been one of vast contributions to our national well-being. This heritage is a principal stumbling block to industry's present attempt to tell its real story to the public.

THE BUSINESS TREND

Activity Index Shows Encouraging Gain

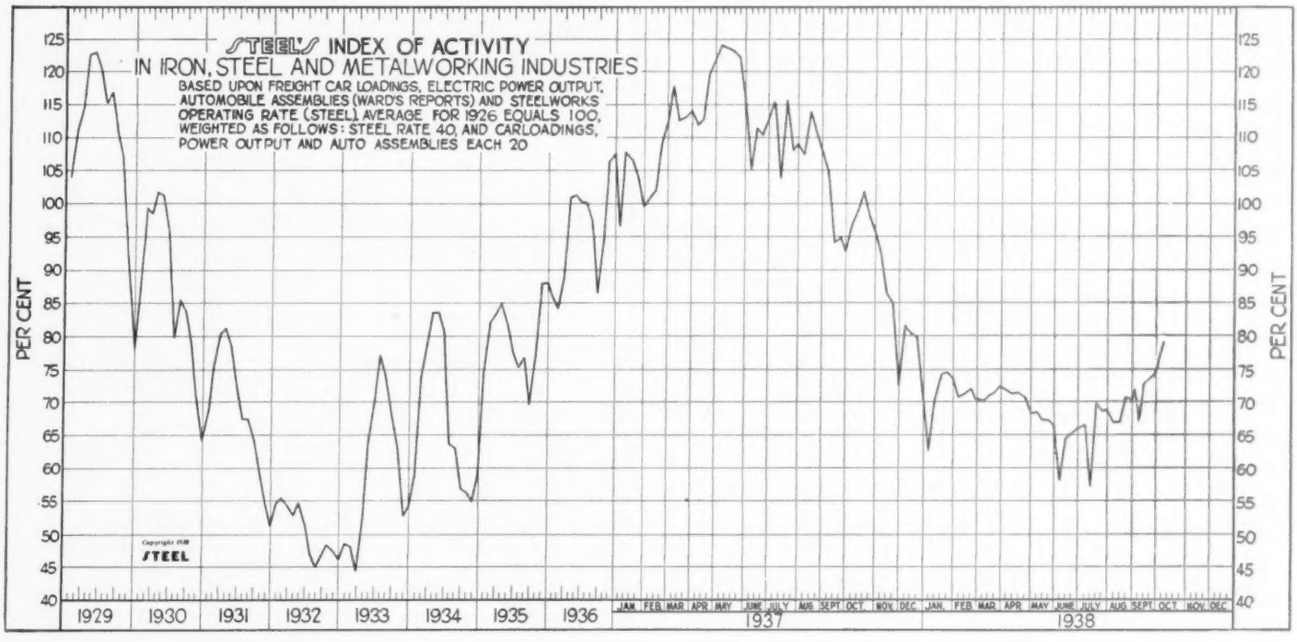
■ ADDITIONAL gains were registered in a number of industrial barometers during the week ended Oct. 8. Reflecting this condition STEEL'S index of activity in the iron, steel and metalworking industries recorded a moderate rise for the fourth consecutive week. The index now stands at 79.0 per cent, a new high for this year, compared with 74.9 in the preceding week and with 99.0 per cent in the identical week last year.

Steelmaking operations increased 1.5 points during the week ended Oct. 8 to 48.5 per cent, more than offsetting the loss incurred during the previous week and forcing this important business indicator into new high ground for any week this year. Present indications are that the national steel rate will register still further gains in the immediate future.

Automobile assemblies continue to improve at an encouraging rate, as automotive builders increase production schedules on 1939 models. During the week ended Oct. 8 assemblies climbed to 37,665 units, against 25,405 in the preceding week and 71,958 in the same week a year ago. Sales reception of the new models appear satisfactory. However, the recent sharp advances in production does not accurately indicate the increasing consumer interest in the new models, inasmuch as a good portion of the current output is for the purpose of supplying the numerous dealers.

Recording the fourth consecutive weekly increase, revenue freight carloadings for the first time since Nov. 6, 1937, climbed above the 700,000 cars-per-week level. Early estimates for the week ended Oct. 8 indicate freight traffic increased approximately 10,000 cars over the preceding week to 707,709. A year ago railroad carloadings were 815,122. Electric power consumption regained all the loss incurred during the preceding week, but remains below the peak this year of 2,154,449,000 kilowatt-hours reported in the week ended Sept. 17.

While the immediate future still remains highly speculative, the broad underlying trend continues to move up-


STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
BASED UPON FREIGHT CAR LOADINGS, ELECTRIC POWER OUTPUT, AUTOMOBILE ASSEMBLIES (WARD'S REPORTS) AND STEELWORKS OPERATING RATE (STEEL) AVERAGE FOR 1926 EQUALS 100, WEIGHTED AS FOLLOWS: STEEL RATE 40, AND CARLOADINGS, POWER OUTPUT AND AUTO ASSEMBLIES EACH 20
PER CENT
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938

STEEL'S index of activity gained 4.1 points to 79.0 per cent in the week ended October 8:

Week ending	1938	1937	1936	1935	1934	1933	1932	1931	1930	1929
July 2	66.5	115.3	97.5	64.1	79.4	77.0	49.2	64.1	75.0	107.8
July 9	57.1	103.8	100.9	76.5	52.3	71.4	41.7	69.4	86.9	116.8
July 16	69.9	115.7	99.9	79.8	67.8	79.1	46.9	70.0	79.1	115.5
July 23	68.7	108.0	102.1	80.8	68.1	79.4	51.5	69.7	78.7	120.8
July 30	69.0	109.1	102.5	78.4	66.4	78.8	46.1	68.9	79.2	117.2
Aug. 6	66.9	107.3	98.7	73.4	64.6	75.9	45.1	67.0	85.6	117.2
Aug. 13	66.9	113.8	92.6	77.5	64.6	74.7	44.6	67.4	86.2	116.8
Aug. 20	70.5	110.3	97.7	77.0	61.4	74.2	44.9	67.3	88.5	116.4
Aug. 27	70.3	108.5	94.0	77.3	60.3	71.6	45.2	66.5	87.4	116.9
Sept. 3	72.3	104.8	87.5	70.9	55.1	70.3	45.4	65.3	79.0	106.3
Sept. 10	66.8	94.3	83.1	70.1	53.5	65.5	44.9	60.9	85.9	114.0
Sept. 17	72.9	95.0	90.1	69.4	58.7	69.1	47.8	65.6	86.2	112.2
Sept. 24	74.0	93.0	86.2	68.5	58.1	68.2	48.0	65.2	83.8	110.7
Oct. 1	74.9†	96.6	89.0	73.3	59.3	66.9	47.7	62.4	81.0	109.1
Oct. 8	79.0*	99.0	93.4	74.9	54.7	67.4	48.4	61.5	79.4	108.2

* Preliminary. † Revised.

ward at a slightly increased pace. The recent gains may reflect the release of deferred demand resulting from the general fear of a European war during September.

NET RAILWAY OPERATING INCOME IMPROVES

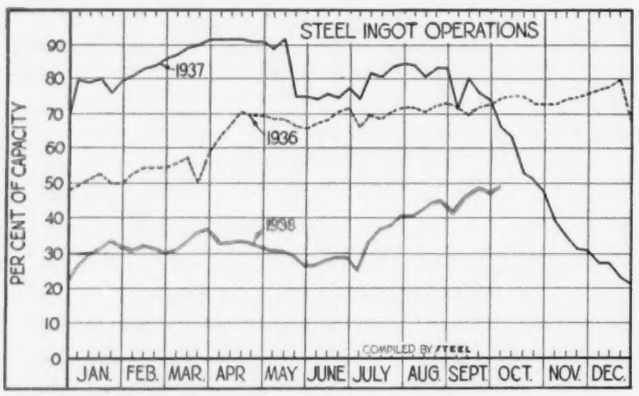
Net operating income for class I railroads during August amounted to $45,376,622, against $50,756,743 in the same month last year and $38,387,209 during July. Rate of return on property investment in August was 1.67 per cent. For the first eight months the net operating income totaled $154,711,883 or a return on investment of 0.99 per cent, compared with $411,208,051 equal to an investment return of 2.63 per cent during the same period last year.

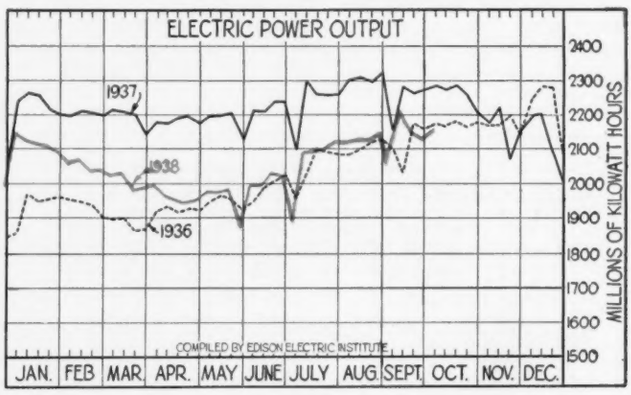
FINISHED STEEL SHIPMENTS LARGEST THIS YEAR

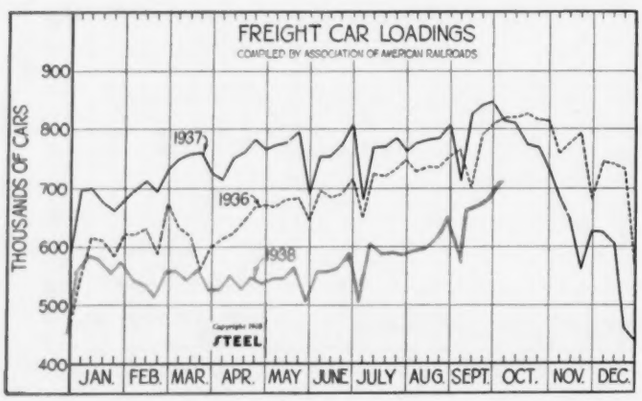
Shipments of finished steel products during September by the U. S. Steel Corp. showed an increase of 19,032 tons to 577,666 tons. This compares with 558,634 tons in August and represents a decrease of 470,296 tons from the 1,047,962 tons shipped in September last year. September shipments were the largest since November, 1937, when they totaled 587,241. For the nine months ended Sept. 30 shipments totaled 4,588,224 tons, against 10,956,846 tons in the same 1937 period.

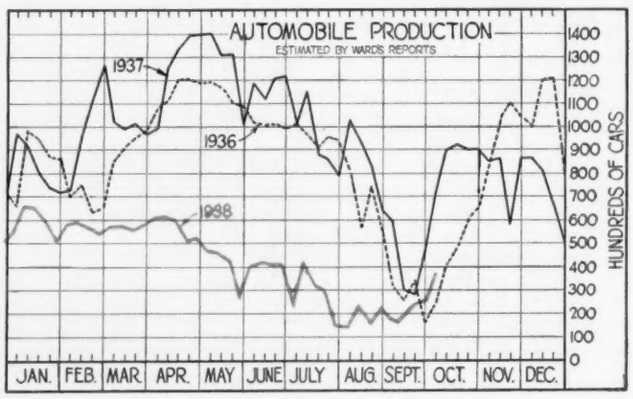
STEEL INGOT PRODUCTION REGISTERS INCREASE

Average daily ingot production in September totaled 106,310 gross tons, compared with 94,333 tons in August and with 171,580 tons during September a year ago. Total production of 2,657,748 tons last month represented an increase of 4½ per cent over the August volume of 2,546,988 tons. Output in the first three quarters totaled 18,005,938, a decline of 58 per cent from the 42,482,597 tons produced in the corresponding period of 1937. During September ingot operations averaged 46.28 per cent of capacity, against 42.85 per cent in August and with 76.30 per cent in September, 1937. In the nine months ended Sept. 30, ingot operations averaged 34.41 per cent, less than half of the average of 83.09 per cent in the corresponding 1937 period.



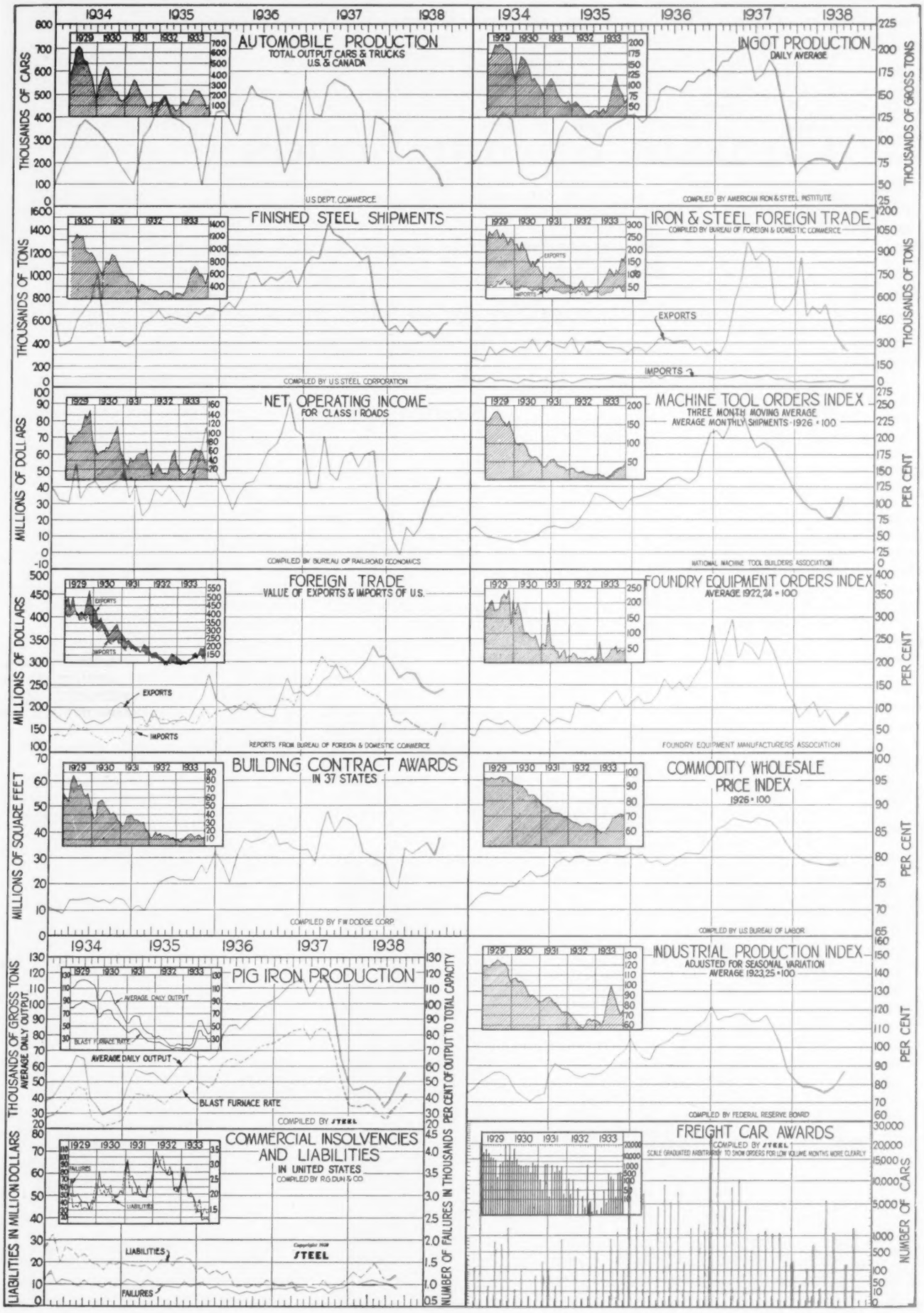






Week ending	Steelworks Operating Rate Per Cent 1938	1937	1936	Electric Power Output Million KWH 1938	1937	1936	Freight Car Loadings 1938	1937	1936	Weekly Auto Output 1938	1937	1936
July 2	28.0	77.5	66.0	2,014	2,238	1,956	588,864	806,168	649,759	40,945	122,890	100,697
July 9	24.0	74.0	69.5	1,881	2,096	2,029	501,013	682,205	724,324	25,375	100,981	97,833
July 16	32.0	82.0	68.5	2,084	2,298	2,099	602,300	770,075	720,402	42,010	115,380	91,317
July 23	36.0	81.0	70.5	2,084	2,258	2,088	580,882	770,980	731,062	32,070	88,055	96,863
July 30	37.0	84.0	71.5	2,093	2,256	2,079	588,703	782,660	747,551	30,390	86,448	95,970
Aug. 6	40.0	84.5	71.5	2,115	2,261	2,079	584,050	769,706	728,293	14,771	78,736	81,804
Aug. 13	40.0	84.0	70.5	2,133	2,300	2,093	589,561	777,382	736,497	13,790	103,250	56,679
Aug. 20	41.5	81.0	72.0	2,138	2,304	2,125	597,918	781,247	734,973	23,940	93,339	73,709
Aug. 27	43.5	83.0	73.0	2,134	2,294	2,135	620,511	787,373	753,742	18,700	83,310	53,937
Sept. 3	44.5	83.0	71.5	2,148	2,320	2,098	648,039	804,633	764,680	22,165	64,200	31,628
Sept. 10	41.5	72.0	69.5	2,048	2,154	2,028	568,887	711,299	699,859	17,485	59,017	26,750
Sept. 17	46.0	80.0	72.5	2,214	2,280	2,170	660,142	826,565	789,510	16,100	30,150	33,165
Sept. 24	48.0	76.0	73.0	2,154	2,265	2,157	675,553	840,446	807,070	20,390	28,030	15,680
Oct. 1	47.0	74.0	74.5	2,139	2,275	2,169	697,938†	847,245	819,126	25,405	45,830	22,800
Oct. 8	48.5	66.0	75.0	2,154	2,280	2,168	707,709*	815,122	820,195	37,665	71,958	39,945

*Preliminary. †Revised.


AUTOMOBILE PRODUCTION
TOTAL OUTPUT CARS & TRUCKS U.S. & CANADA
U.S. DEPT. COMMERCE
THOUSANDS OF CARS
INGOT PRODUCTION
DAILY AVERAGE
COMPILED BY AMERICAN IRON & STEEL INSTITUTE
THOUSANDS OF GROSS TONS
FINISHED STEEL SHIPMENTS
COMPILED BY U.S. STEEL CORPORATION
THOUSANDS OF TONS
IRON & STEEL FOREIGN TRADE
COMPILED BY BUREAU OF FOREIGN & DOMESTIC COMMERCE
EXPORTS
IMPORTS
NET OPERATING INCOME
FOR CLASS I ROADS
COMPILED BY BUREAU OF RAILROAD ECONOMICS
MILLIONS OF DOLLARS
MACHINE TOOL ORDERS INDEX
THREE MONTH MOVING AVERAGE
AVERAGE MONTHLY SHIPMENTS 1926 = 100
NATIONAL MACHINE TOOL BUILDERS ASSOCIATION
PER CENT
FOREIGN TRADE
VALUE OF EXPORTS & IMPORTS OF U.S.
REPORTS FROM BUREAU OF FOREIGN & DOMESTIC COMMERCE
FOUNDRY EQUIPMENT ORDERS INDEX
AVERAGE 1922-24 = 100
FOUNDRY EQUIPMENT MANUFACTURERS ASSOCIATION
BUILDING CONTRACT AWARDS
IN 37 STATES
COMPILED BY F.W. DODGE CORP.
MILLIONS OF SQUARE FEET
COMMODITY WHOLESALE PRICE INDEX
1926 = 100
COMPILED BY U.S. BUREAU OF LABOR
PIG IRON PRODUCTION
AVERAGE DAILY OUTPUT
BLAST FURNACE RATE
COMPILED BY STEEL
THOUSANDS OF GROSS TONS AVERAGE DAILY OUTPUT
PER CENT OF OUTPUT TO TOTAL CAPACITY
INDUSTRIAL PRODUCTION INDEX
ADJUSTED FOR SEASONAL VARIATION
AVERAGE 1923-25 = 100
COMPILED BY FEDERAL RESERVE BOARD
COMMERCIAL INSOLVENCIES AND LIABILITIES
IN UNITED STATES
COMPILED BY R.G. DUN & CO.
LIABILITIES
FAILURES
LIABILITIES IN MILLION DOLLARS
NUMBER OF FAILURES IN THOUSANDS
Copyright 1938 STEEL
FREIGHT CAR AWARDS
COMPILED BY STEEL
SCALE GRADUATED ARBITRARILY TO SHOW ORDERS FOR LOW VOLUME MONTHS MORE CLEARLY
NUMBER OF CARS

Chassis Spring Loads

Are automatically applied and measured by ingenious design of testing machine. With capacity up to 5250 pounds, repeat readings for accuracy show a variation of less than one pound, or 0.002-inch of specified height

■ INCREASING softness of motor car suspension springs demands a higher degree of accuracy in measuring spring rates and loads. Errors of 5 and 10 pounds in either characteristic may have a marked effect on the riding quality or appearance of a car having suspension rates at or below 100 pounds per inch. Yet usual load testing machines in spring shops, car assembly plants and engineering laboratories invariably have had limits of error even in excess of 10 pounds in loading rates.

Recently the suspension department of the Chrysler engineering laboratories decided to build a new machine for laboratory use with the following specifications:

Accuracy of the load readings given by the machine should be unquestionable; load indicating device should be graduated in increments not greater than 1 pound; machine should be as nearly automatic in operation as possible in order to save time and to eliminate human errors. It should deflect the springs to certain specified loaded heights without the need for visual observations and adjustments of the spring height by the operator before reading the load.

A platform scale of the springless type was considered the most dependable device for measuring and indicating the load, inasmuch as its accuracy can be verified easily with dead weights. A motor driven mechanical system was chosen for applying the load on the spring. Such a system also holds the spring in position over a period of time.

Framework of the machine is built of standard structural steel shapes. Frame and driving mechanism are covered with sheet metal panels for appearance and safety. The superstructure built on the scale platform transfers the load to the corners of the platform directly over the supporting knife edges. Tracks, shown in Fig. 1, are provided for the leaf spring trucks thus accommodating instantly a variety of pins and spacers to automatically center leaf springs of any specified width and eye diameter. The coil springs and the control switch pedestal are mounted on a centrally located heavy steel plate.

Driving and loading mechanism employs two screws at opposite ends of the leaf spring track. These carry and drive the loading beams and head through bronze nuts set in iron castings, leaving an unobstructed view of the scale dial through the center of the machine. Thrust loads are taken by ball bearings at lower end of the screws. These screws are driven through bevel gears by a countershaft which in turn is driven by a 7½-horsepower direct-current motor through a

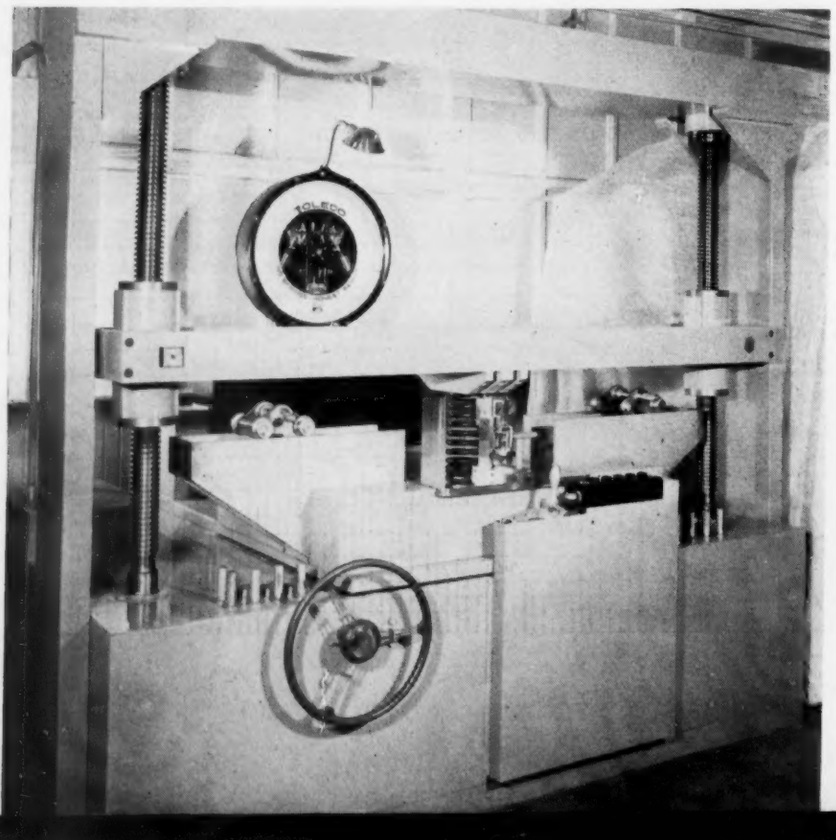


Fig. 1—Push button operated spring testing machine accommodates wide variety of automotive type springs using movable rollers on tracks as shown here

speed reducer and chain. Motor-to-screw speed reduction is 30 to 1 and the normal linear speed of the loading head is about 3 feet per minute. This is too slow for production checking but is ideal for the more varied and painstaking work done in the laboratory.

A tarring device is operated by a conveniently located handwheel, the automotive type steering wheel in Fig. 1. It has a capacity of 50 pounds which is more than the variation between the weights of the lightest and heaviest passenger car springs. With it, the scale dial can be set at zero after any spring is placed on the platform and before the test is begun.

Readings Precise

Scale dial is graduated from zero to 1000 pounds in one-pound divisions and hence can be read accurately to at least one-half pound. Additional capacity is available in 500 to 1000-pound increments up to a total of 4000 pounds. Amount added is registered at bottom of dial and is controlled by a handle at front of machine. Tare beams can be adjusted to provide 1250 pounds more capacity, thus making 5250 pounds the maximum load which can be registered.

After considerable searching, a so-called "vacuum contact tube" was found to possess suitable qualifications for interrupting the current for the electric driving motor, thereby stopping the load-applying mechanism when the spring is compressed the exact specified distance. This is a mechanically simple single-pole double-throw switch. Its contacts are sealed within an evacuated can and are actuated by a force of not more than 70 grams which will not affect the dial reading. The extreme end of the operating arm moves only 0.070-inch from one contact position to the other so the switch can be expected to break the control circuit here repeatedly with a variation in operating arm position of not more than plus or minus 0.003-inch.

There are two of these switches, one to slow down the motor to about one-tenth of its normal speed and the second to stop and brake the motor when the spring has been compressed the exact distance specified. They are mounted in a case which is supported on a pedestal so it can be fixed easily at various heights above the scale platform to correspond with the specified spring heights. See Fig. 2. The switch pushrod extending upward from the case engages a clamp placed around the leaf spring at the center bolt. In the case of a coil spring, switch pushrod engages the loading head directly.

A five-button control station is provided. One button is a "forward" control which causes the loading head to move downward, engaging and compressing the spring until the automatic switch assembly is actuated at which time the motor automatically is first slowed down and then brought to an almost instantaneous stop by dynamic braking. Second push-button is a "reverse" control which causes the loading head to rise to the upper limit of its travel where it is brought to rest by a limit switch.

A "stop" button is provided which can be used to arrest either upward or downward travel of the head at any point. The two remaining buttons are "jog forward" and "jog reverse." These cause the machine to creep at one-tenth normal speed only as long as the buttons are depressed. Thus a means is available for bringing springs to heights other than those provided by the various positions at which the automatic switch may be set. The jog control is sufficiently delicate to make unnecessary any provisions for operating the machine with manual power.

Another limit switch stops the machine as soon as the dial pointer goes off scale. This prevents damage to scale mechanism and also serves as an automatic stop when bulldozing coil springs with a given load. Yet another limit switch makes the machine totally inoperative whenever the dial pointer is located at zero. This is an important safety measure to prevent accidental overloading of any part of the machine.

Results obtained with the machine have been satisfactory, particularly as to operation of the automatic stopping mechanism. One of the specifications set up for the machine required that when stopped on repeated tests by the automatic switch, the position of the loading head and hence the spring height should not vary by more than plus or minus 0.007-inch or a total variation of approximately 1/64-inch.

Repeated load readings taken on the same spring have remained well within these limits. Load readings on a typical independent suspension coil spring of about 300 pounds per inch rate do not vary among themselves by more than one pound. This means that the spring height is within plus or minus 0.002-inch of the specified height when the load is read which is certainly satisfactory considering the magnitude of the loads involved, the mass and size of the moving parts and the fact that the operator does nothing but push a button.

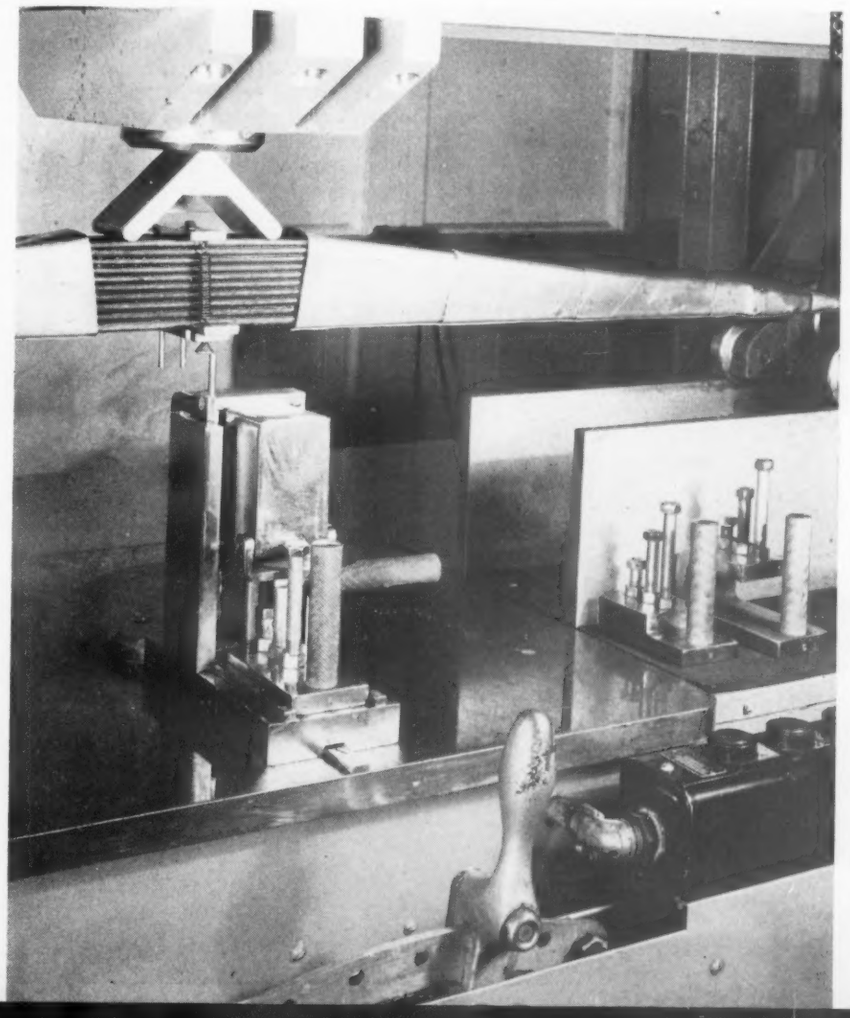
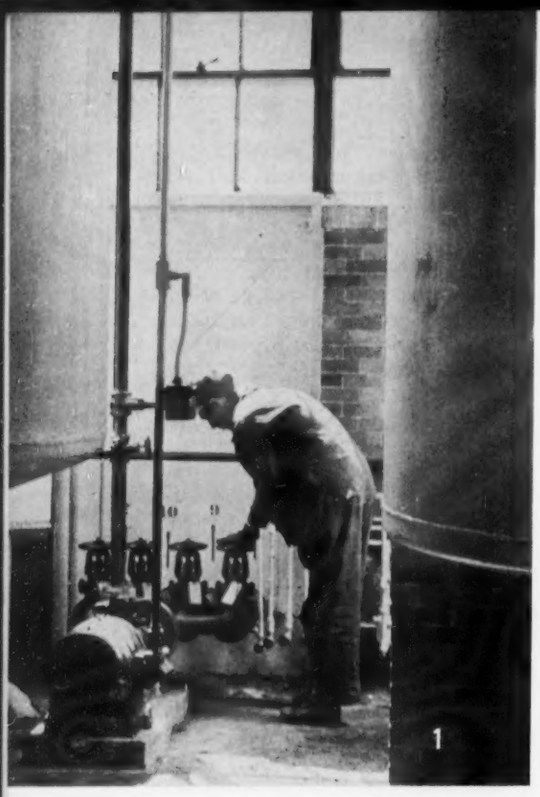


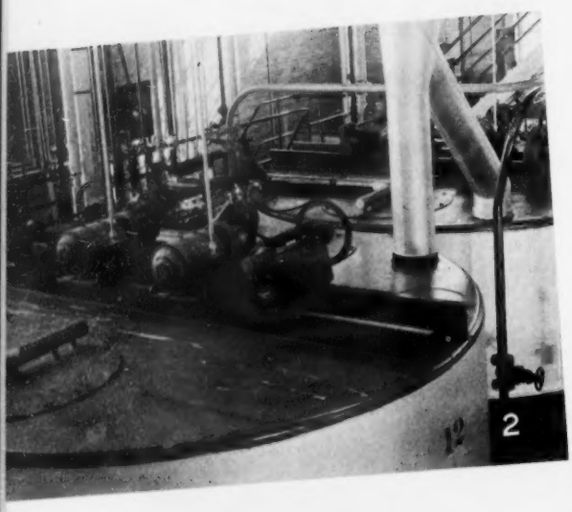
Fig. 2—Closeup of testing head shows the box containing the two vacuum switches which automatically stop the spring loading motor



Synthetic Rubber Depends On Steel and Alloys

■ PRODUCTION of the synthetic rubber originated by Thiokol Corp., Trenton, N. J., recently was turned over to Dow Chemical Co., Midland, Mich., while the Thiokol Corp. will market and widen the applications of this unique material. "Thiokol," the name given synthetic rubber made by this process, not only possesses the properties of natural rubber but has the ability to withstand petroleum, many solvents and chemicals, sunlight, air and moisture.

This immunity to deterioration resulted in wide adoption by the petroleum industry in handling oil and gasoline. These synthetic rubbers are available in several forms including crude synthetic rubber, liquid coating materials, printing plate powders and molding powders. The crude product is fabricated by the identical methods employed with natural crude rubber while the powdered forms are combined into finished rubber products by thermoplastic molding.



In the manufacture of synthetic rubber, the tanks employed to hold the material in various stages of the process are constructed of standard boiler-plate steel with the exceptions of acidification tanks in which 18-8 stainless steel is used. Fig. 1 shows typical welded steel tanks used in this process. Piping between tanks, such as that shown in Fig. 2, utilizes conventional material. Copper or brass cannot be employed because of the effect produced on these metals by the chemical employed in the process. Therefore, all valves and fittings, such as those in Figs. 3 and 4, are made of steel and have no brass trim.

Neither can any lead be used. This eliminates soldered joints so welding is the method employed in fabricating all of this equipment, including tanks and other apparatus shown in accompanying illustrations.

The heating oils in the caustic tank are made of nickel since steel here would be subjected to caustic embrittlement. Temperatures are not sufficiently high to have any destructive effect.

Either monel or nickel can be used for the filter press screen. The wire cloth which conveys Thiokol in the continuous drier, shown in Fig. 6, is made of steel. The squeeze rolls are constructed of steel and covered with rubber.

The making of Thiokol is an interesting process. It involves three basic steps: The creation of polysulphide, the reaction between this and ethylene dichloride to form synthetic rubber latex, and the coagulation of this latex to obtain synthetic rubber.

Sodium polysulphide and liquid ethylene-dichloride are stored outside the plant in tanks. In a central receiving room sulphur, the other basic material, is stored.

Sulphur and other materials first are caused to react in tanks to form polysulphide. This material then is filtered and led to the outside

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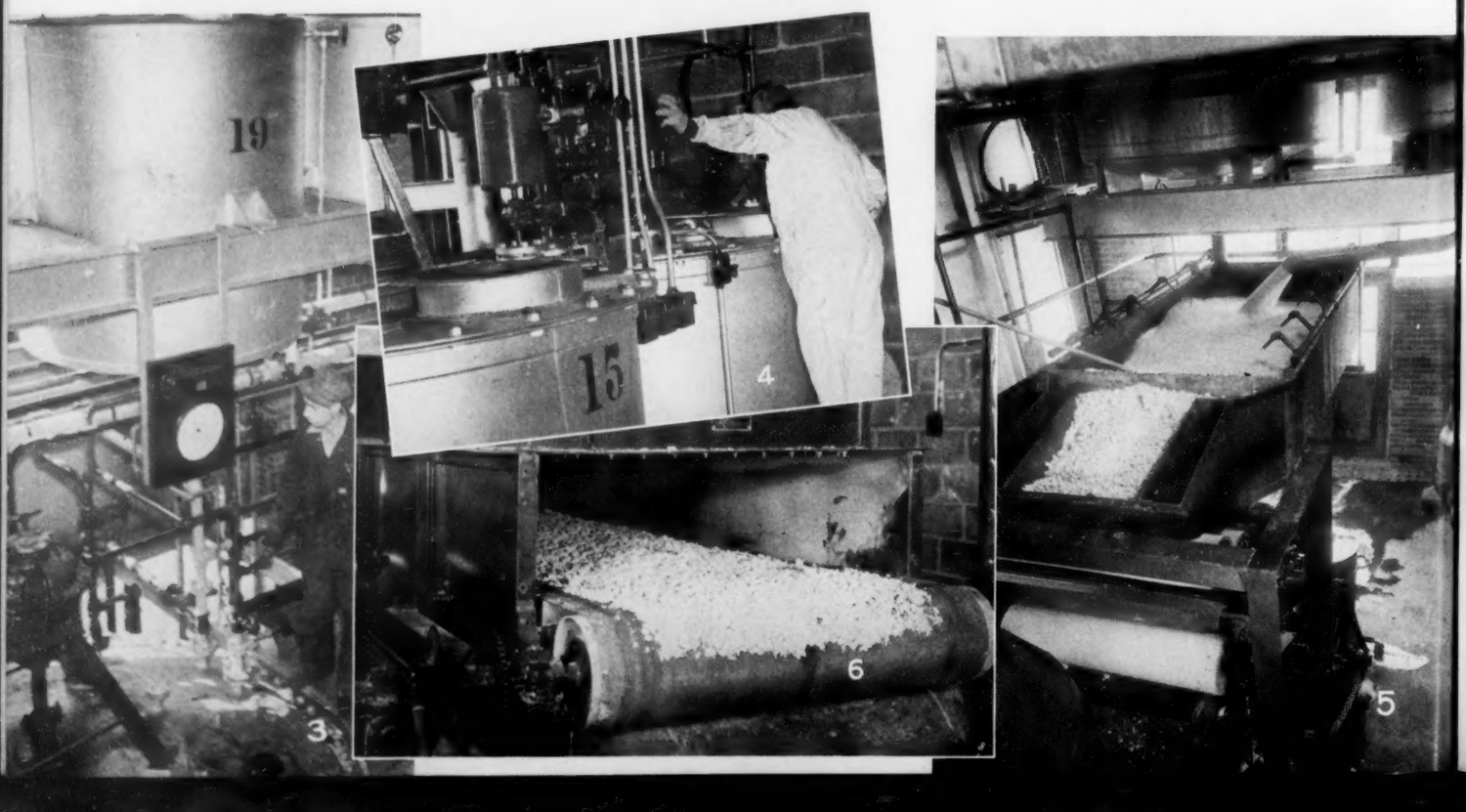

Powder Metallurgy Finds New and Important Uses

■ INCREASED manipulation of metal powders and an expanding number of processes by which they are bonded or alloyed makes for a steady gain in powder metallurgy, a science which was reviewed in detail by G. J. Comstock, Handy & Harman, Bridgeport, Conn., at the fall meeting of the American Society of Mechanical Engineers in Providence, R. I., Oct. 5-7. Several hundred attended the society's three-day meeting which featured sessions on machine shop practice, plant production and management.

Principal commercial problems in powder metallurgy have passed the experimental stage, it was stated. Much of the recent impetus has been derived from the electrical industry which has found new uses for products of the process. In general, objects fabricated from metal powders are confined to relatively small size. A large automobile builder is producing small parts molded from iron powders bonded by heat treatment and re-pressed in sizing molds to precise dimensions. According to Mr. Comstock, accurate sizing is a feature of powder molding.

Production of small iron-aluminum-nickel-cobalt magnets indicates a trend toward use of metallic powders. These magnets, required extensively for meters and other small electrical devices, can be produced efficiently and economically. They are pressed to shape from the powders, alloyed by diffusion during the consolidating heat treatment, and require little or no subsequent finishing. This magnetic alloy is difficult to cast and machine, thus powder metallurgy has promoted use of this valuable material.

Four important commercial products are manufactured in quantity from metallic powders. These are the refractory metals, tungsten, molybdenum and tantalum; electrical contact and electrode materials; porous bearings; and cemented carbides for tools and dies.

Production of metallic forms from molybdenum and tantalum has in general followed manipulation applied to ductile tungsten with such variations as their individual characteristics have demanded. Availability of these refractory metals in sheets, strip, rods and wire, and fabricated articles, has led to useful and important developments in the chemical, electrical and communication field.

Metal powder contact materials for electric current interrupting and electrode applications owe their development to one interesting effect peculiar to all metal powder products. According to Mr. Comstock, this relates to the composite physical properties which the fine aggregates display. Alloys produced by melting and casting generally possess properties inherently their own. Powder products, on the other hand, retain original characteristics of the component metals in almost direct proportion to their presence in the composition.

Applied to Circuit Breakers

Advantage is taken of this phenomenon in applying these materials to circuit breakers, welding machines and other electrical devices. Efficiency of early resistance welding machines was affected seriously by tendency of electrodes to fuse and pit. It was found that a material having some refractory character of tungsten and at least a portion of the thermal and electrical conductivity of copper was required. Powder mixtures of these metals consolidated by heat treatment display these properties in an easily regulated manner, declared Mr. Comstock.

Circuit breakers must not stick or weld together. Heavy current, arcing at the point of interruption, promotes fusing and welding. In certain applications metal powder aggregates have proved indispensable. Silver is used as one component, said Mr. Comstock, because of its high electrical and thermal conductivity and also because its oxide is unstable at relatively low temperatures. Nickel, molybdenum and tungsten are combined with it because of their nonwelding and high melting characters. Graphite is combined with silver because its anti-fluxing action mechanically prevents welding. These combinations of metals, or metal with the metalloid carbon, have no special affinity for one another, and, as they do not form alloys, could not be produced by melting.

These contact materials can be made in ductile forms of sheet, strip, rod and wire. These are produced by pressing and sintering the powder mixtures to promote the adhesion first obtained in the previous process and then alternately mechanically working and heat treating until complete bonding is attained. When this is done, according to Mr. Comstock, bonding of powder particles closely resembles the intergranular bonding of cast products and the ordinary methods of further fabrication can usually be applied to them without hazard.

Thin ductile sheets of contact material or bimetallic contacts combining these ductile powder contact materials with steel, copper or other metallic bases are available for commercial applications. Development of powder metallurgy for material for contacts and electrodes represents a highly specialized division of the art and better bonding has done much to promote its success.

Development of porous metal bearings is one of the important and far-reaching applications of powder metallurgy. By manipulation, formations of unusual structural effects are attained that would not be feasible by casting. Porous bearings contain copper, tin and graphite combined as powders with a lubricant and pressed to form. Heat treating under conditions that promote diffusion and alloying between copper and tin particles produces a regulated and continuous porosity. Subsequently bearings are exactly sized in dies and impregnated with oil.

An iron or iron-copper alloy has been produced recently, says Mr. Comstock, for excessively heavy pressures. Capillarity of these bearings conveys oil directly through the wall of the bearing to the bearing surface thus insuring an adequate supply of lubrication. Oil is automatically supplied to those portions which require it most. In some instances, oil with which the bearing is originally impregnated is sufficient to last during the life of the machine in which it is used. When exhausted, oil may be re-impregnated by conventional methods. Promotion of a lubricating film at the shaft by the porous metal bearing is almost continuous.

Sealed bearings in refrigeration units, performance of many inaccessible bearings, bushings and shims in the automobile, lubrication of textile equipment where excess oil causes spoilage and many other applications, indicate the value of this development.

Cemented Carbides Spectacular

Possibly the most spectacular and revolutionary development in powder metallurgy has been centered around cemented carbides. These are characterized by extraordinary hardness maintained at high temperatures and unusual strength in compression. This group consists of minute particles of hard metallic carbides cemented by a quantity of an alloy which has been molten at one stage of the manufacture of the material. The resulting product has characteristics of both the carbide

and the matrix in almost direct proportion to their presence.

In hard cemented carbide compositions, according to Mr. Comstock, the hard component must be hard, strong and sufficiently metallic to permit its being strongly cemented by the welding or brazing action of the molten cement which is formed during sintering. Tungsten carbides, as first used, cut satisfactorily through cast iron, but for cutting and machining of annealed steels, other compositions have been developed. Tantalum carbides or titanium carbides with tungsten carbides for tougher work have been produced to avoid weld to chip and crater at the cutting edge for steel cutting. A metallic compound of tungsten and titanium in carbide form has been recently developed and used successfully.

Cemented carbides have revolutionized the machining of many materials. Cemented carbide tool and die business in the United States approximates $5,000,000 annually and is still in the early stages of development in the opinion of Mr. Comstock.

Process Applied to Wire

Production of ductile tungsten by processes of powder metallurgy represented a major commercial achievement for there was an immediate and protracted demand. It resulted in a general application of the powder process for the production of filament wire and from it has grown a familiarity with metal powder technique which has led to other valuable metal powder products.

Fabrication of objects from metal powders is not new, but Mr. Comstock pointed out that the result of striking characteristics of recent products, has promoted a thorough investigation of possibilities for further development.

Electric design developments in the machine tool industry have been rapid during the last five years, but the pace will be further increased during the next five, in the opinion of B. P. Graves, Brown & Sharpe Mfg. Co., Providence, who discussed motor drives and electric controls on machine tools. In this progress, manufacturers of electrical equipment are co-operating closely with builders, improving control devices and making many adaptable to high speed precision tools. From large bulky units, control designs have been changed to small compact units mounted on machines and operated almost continuously.

Tracing the introduction and growth in the use of motor drives, Mr. Graves stated the first constant-drive milling machine in 1904 opened the field for the motor for power drives. No longer are motors and controls considered extras to be added or hung to a machine, but rather they are accepted integral parts of the unit and as new designs and models appear are given special attention.

Motors in the past were used almost solely as sources of power. However, motors can be used for starting and stopping, and can easily be reversed. If then a motor were to be employed in a mechanism, said Mr. Graves, the design could well be laid out to use these possible motor functions. Instead of including a clutch in the mechanism to start and stop the unit, the motor may be started and stopped. Milling machines are now designed with a direct-connected motor to start and stop the spindle mechanism.

Spindle drives of milling machines have always included an idler gear, shaft, and gear-shift lever to give a reverse direction or rotation. With a unit drive a simple manual reversing switch may be adopted to provide reverse motion. Direction of table movement in machines is usually changed with a reversing clutch. A motor-drive design can eliminate the reversing clutch and turn this function over to the motor. Reversal of small motors is rapid and smooth.

Grinding of threads for commercial purposes has not been developed as rapidly in the United States as in several European countries, according to Paul V. Miller, Taft-Peirce Mfg. Co., Woonsocket, R. I., who reviewed recent developments in thread grinding practice. However, in the small tool industries with precision a vital factor, progress has not lagged in this country. A combination of circumstances may be responsible for this, in Mr. Miller's opinion, such as better threading tools, higher wage rates here, and also that only comparatively recently have American builders been offering thread grinding machines to customers. The possibility of thread grinding as a means of producing a higher quality indicates a marked increase in the practice in the next few years.

Aircraft Is New Field

For many years thread grinding was confined largely to the cutting tool and gage industries, but aircraft manufacture requires threads finished to a high degree of accuracy, either by milling or grinding. Grinding of threads is generally admitted to be somewhat more expensive than milling, but where tolerances of pitch diameter, pitch, angle and finish are so close as to make the milling operation particularly difficult, and often expensive because of rejected material, grinding is frequently more satisfactory and in the last analysis more economical.

Many improvements have been made in the manufacture of grinding wheels. Mr. Miller stated it is now almost impossible to detect appreciable variation in the cutting qualities of wheels made to the same specification. Development of materials for better bonding has resulted in a stronger wheel, making it possible to operate at higher speeds. This gives improved cutting qualities and a longer wheel life between dressings.

Type of grinding and method to be employed in developing the finished threads are as important as to the selection of the machine and wheels. Type of work and ease or difficulty which it may be handled may have an important bearing on the scheduling of threading operations. A vital question is whether the thread should be ground from the solid or whether it should be milled before heat treating and hardening.

Trend Toward Larger Wheels

The trend in recent years has been toward larger diameters of wheels. This gives a greater periphery with a resulting longer cutting life between dressings. Profiling of the wheel and the maintenance of its contour has probably been the most serious and troublesome problem involved in the grinding of threads, says Mr. Miller, but with wheels from 16 to 20 inches diameter a higher peripheral speed can be maintained, and with the greater circumference a proportionate increase in wheel life between dressings is made possible. This development has undoubtedly increased the cutting qualities of the grinding wheel to the point where the grinding of parts other than taps and gages has proved to be economical.

In Europe, many machines still have wheels of about 12 inches diameter, but it has been the custom there for some time to use multiple wheels with several convolutions dressed in the face of the wheel.

Lapping and honing were discussed in detail by Herbert S. Indge, Norton Co., Worcester, Mass., under the subject of the refinement of ground surfaces. These operations will produce surfaces which will not wear rapidly while lapped plug and other gages often outwear many times those finished by grinding only. Automobile parts are also being lapped to provide longer life, interchangeability and easy assembly.

Two defects often appear in ground surfaces which may be removed by these refining processes. One is surface roughness produced by the grains of the grinding wheel

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ADVERTISING PAGES REMOVED

Trends Point to Increased Use of Gas by Industry

■ SALES of gas to industrial consumers increased sharply last year, compared with 1929 as well as 1932, members of the American Gas association were informed at their twentieth annual convention in Atlantic City, N. J., Oct. 10-13. More than 2000 members attended the four-day meeting.

Conrad N. Lauer, president, Philadelphia Gas Works Co., Philadelphia, was elected president of the association for 1938-39. Walter C. Beckjord, vice president and chairman executive committee, Columbia Gas & Electric Corp., New York, was chosen as first vice president, and T. J. Strickler, vice president and general manager, Kansas City Gas Co., Kansas City, Mo., second vice president. Ernest R. Acker, president, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., was elected treasurer.

Directors for two-year terms were named as follows: Arthur F. Bridge, vice president, Southern Counties Gas Co., Los Angeles; Henry L. Doherty, president, Cities Service Co., New York; Frank A. Newton, Commonwealth & Southern Corp., New York; Frank H. Payne, president, American Meter Co., Erie, Pa.; W. T. Rasch, president, American Gas Products Corp., New York; Herman Russell, president, Rochester Gas & Electric Corp., Rochester, N. Y.; N. T. Sellman, assistant vice president, Consolidated Edison Co. of New York Inc., New York; Marcy L. Sperry, president, Washington Gas Light Co., Washington; and William G. Woolfolk, president, Michigan Consolidated Gas Co., Detroit.

New heads of six divisions of the association are as follows: *Industrial Gas Section*—Frank H. Trembly Jr., Philadelphia Gas Works Co., Philadelphia, chairman; Franklin T. Rainey, Ohio Fuel Gas Co., Columbus, O., vice chairman. *Technical Section*—F. M. Goodwin, Boston Consolidated Gas Co., Boston, chairman; A. M. Beebee, Rochester Gas & Electric Corp., Rochester, N. Y., vice chairman. *Manufacturers' Section*—Merrill N. Davis, S. R. Dresser Mfg. Co., Bradford, Pa., chairman. *Natural Gas Department*—T. R. Weymouth, Columbia Gas & Electric Corp., New York, chairman; Elmer F. Schmidt, Lone Star Gas Co., Dallas, Tex., vice chairman. *Commercial Section*—F. X. Mettenet, Peoples Gas Light & Coke Co., Chicago, chairman; Davis M. DeBard, Stone & Webster Service Corp., New York, vice chairman. *Accounting Section*—H. A. Ehrmann, Consolidated Edison Co. of New York Inc., New York, chairman; F. B. Flahive, Columbia Gas & Electric Corp., New York, vice chairman.

Reporting the expanding volume of gas sold to industrial consumers, Hale A. Clark, Detroit City Gas Co., Detroit, stated that sales of manufactured gas last year were 20 per cent higher than in 1929, while natural gas showed a 50 per cent increase. Manufactured gas sales to industry rose 67 per cent last year as compared to 1932. At the same time, industry increased its purchases of natural gas 90 per cent.

Mr. Clark pointed out present and prospective trends which are expected to result in increased business for gas utilities. Development work now is under way for application of noncorrosive coatings to steel by passing it through furnaces in which the atmosphere is metal in vapor form.

Pickling in an atmosphere of acid gas is said to be making further strides since costs are reduced through elimination of pickling tanks and lower maintenance and labor charges. Dry cyaniding, which is in effect a combination of continuous nitriding and continuous carburizing, is coming more prominently into the picture. The atmosphere can be so varied as to produce a case having the desired concentration of carbides and nitrides.

Radiant Tube Cited

Development of the gas-fired radiant tube is given much of the credit for the extension of the use of gas in industry since it permits precise control of atmospheres. Radiant tube heat recently has invaded the sheet metal enameling field which previously used electric heat almost exclusively. Convection heating, which depends upon the circulation of hot gases, also is encountering wider acceptance for drawing and tempering. While generally applied to small parts, some large furnaces have been built recently for treating oil well casing.

The gas industry is studying the air conditioining field closely as an outlet for its product and the outcome is certain to have a marked effect on manufacturers of such equipment. The committee which conducted this study found that commercial air conditioning is not likely to increase the gas load much although gas apparatus has been firmly established in this field.

It is believed that present types of residential air conditioners will not penetrate deeply into this potentially enormous market. However, gas, with its advantage for conditioning by moisture absorption, is very much in the race now starting. In the gas dehumidification process, the wet air is passed over beds of absorbents such as silica gel or activated alumina. The saturated beds are reactivated by a stream of hot air. The dehumidified air is cooled by pass-through water-cooled coils. It is said that a midwestern company is about ready to market gas equipment at around $300 or $350 which may be operated in connection with the usual residential heating unit.

It was pointed out in a report by the gas engine power committee that most new diesel engine models being brought out are convertible to gas or can be offered for straight gas operation. In some sections gas is used as fuel during the off-peak season when rates are lower and oil during the period of peak gas consumption. Sales of gas engines have continued to expand, particularly for driving generators, air compressors and pumps. Regarding the future, the industry expects gas engines to compete actively with electric motors.

G. E. Grimshaw, manager, industrial insulation department, Johns Manville Corp., New York, cited the improvements which have taken place in insulating materials over the past 25 years. Such materials were not available to resist temperatures over 1300 degrees Fahr., whereas today 3000 degrees is not the temperature limit for successfully using some insulating refractories. Developments in the design and operation of furnaces and ovens have advanced at a rate not easy for makers of insulating materials to keep up with, he said.

In deciding the type of insulation, he said, it is advisable to consider the individual portions of the furnace separately. For example, insulating fire brick may be most adaptable for the side walls and arches of a furnace, whereas fire clay or silica brick would be necessary for the hearth because of abrasion usually present in that location. Economical thickness should be determined whether fire clay or insulating fire brick are used. Often, he said, it is not necessary to increase the thickness of insulating fire brick beyond that required for structural rigidity. More efficient materials may be used as backup insulation.

Mr. Grimshaw pointed out that many old furnaces still in operation are built of heavy refractory walls with little or no insulation but could be made to produce an excellent return on the investment if insulated efficiently. Proper insulation of old or existing furnaces, he

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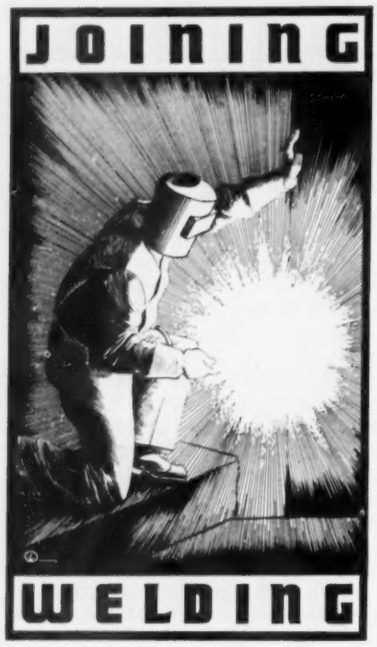


Spotwelding Aircraft

Solution produces large savings in cleaning alloys prior to welding. Careful sequence planning permits assembling all types of structures by spotwelding between two fixed arms

PART II

By C. L. HIBERT
Consolidated Aircraft Corp.
San Diego, Cal.

■ FOR CLEANING of aluminum alloys, a tragacanth-hydrofluoric acid etching solution is used to remove the oxide film. The acid, gum and alcohol are kept in separate containers and only mixed in a stainless steel pan prior to their use. The gum is boiled to a molasses consistency and diluted with water and alcohol when mixed with the acid. A lead-lined sink and drain board is provided with running water for washing the acid off after painting or dipping the parts.

Cleaning solution is only permitted to remain for about 30 seconds. Then it is necessary to go over the cleaned area with a wet rag to remove the oxide physically. Both surfaces of the joint to be spotwelded are cleaned by this method and remain clean for several days thereafter. On stock heat treated several times, it is necessary to break the film with sandpaper to allow the acid to get beneath the surface and lift the coating free.

This method of cleaning has reduced labor costs to about half that of the wire brushing method and is less destructive to the Alclad alloys. It also has been found best to handle cleaning in the spotwelding department to insure good results and to ascertain labor costs.

About 65 parts are being spotwelded on the present flying boat contract with a total of 13,720 spotwelds per ship, a gain of about 50 per cent in the number previously welded on the same type ship. The trend appears to be on the increase for spotwelding of aluminum alloys in aircraft. These welds are effected at the rate of 2000 to 10,000 per shift with about 4000 average per eight hours. I believe 10,000 welds to be the ultimate in speed for spotwelding of aluminum alloys, considering polishing the tips with No. 7/0 sandpaper after 6 to 10 welds and a change of tips after every 200 to 400 welds. The day shift consists of two men and the night shift has one operator and two helpers. These two crews handle all of the spotwelding, including drills and steel welding.

The largest job in production at present has about 1000 spotwelds and the smallest has but three. The jobs are delivered to the spotweld department, fastened with self-tapping screws, and then are disassembled for cleaning. Each job must be planned and assembled in the correct sequence so it can be welded between two fixed arms. If it happens that welds are forgotten, in most instances it is impossible to go back and weld them. One may suspect this is a disadvantage; on the contrary, a planned construction is always cheaper. It may be said as yet no job has been refused as inaccessible and spotwelders are working where one could not rivet at any price.

Spotwelding of Aluminum alloys is handicapped by lack of suitable

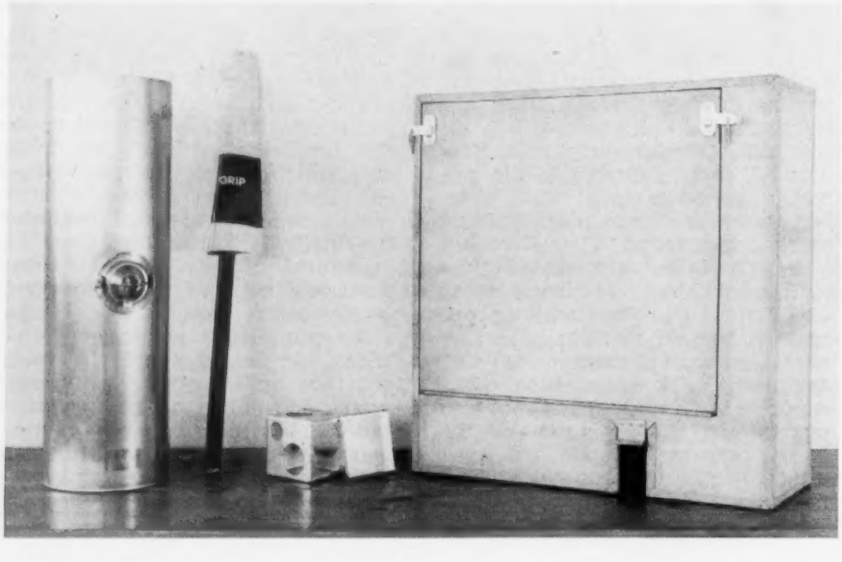


Fig. 3—Spotwelded articles include the stainless steel water container, antenna mast, junction box and food locker shown, in addition to cowl flaps, stowage boxes, inspection doors, tables, etc.

tips, inexperienced operators and the lack of a suitable inspection method. An operator who has no previous experience with spot welding is best. Condition of tips is critical. They must be polished with care and after evidence of pickup must be redressed. It also takes an experienced eye to place welds in the proper position since no jigs or fixtures are used. With aluminum alloys, welds must not be placed too near the edge or in too close to the radii for good fusion.

Frequent test pieces are made during production as a check on electrodes and character of the welds. As exterior appearance of a spotweld means nothing, except in case of bad splashing or appearance of cast structure, a visual method of inspection is out of the question.

Work must be held at right angles to the electrodes for best results; any skewness distributes the current over a greater area, resulting in a poor weld. Use of one flat electrode is not advisable for the same reason.

Army and Navy bureaus restrict the use of spotwelding of aluminum alloys to the following materials: Alclad, 52S and 53ST. These can be welded in any combination. Other aluminum alloys may be spotwelded but are not satisfactory with respect to corrosion resistance.

Non-structural Parts Welded

For the Army, cowling, doors, floors and seats may be spotwelded without further approval. For other parts, drawings must be submitted for specific approval. Up to the present time, only non-structural parts have been approved by the Services. Equipment, personnel and methods must have approval before any spotwelding may be accomplished. Spot-welding of aluminum alloys is still considered to be in the experimental stage so an accurate control is maintained over its application.

As a precaution, we finish all long seams with rivets at the ends to prevent tension failures from starting. Parts that are welded are furnishings and of no importance as to strength characteristics.

To set any limits on the size and shape of objects that can be accommodated on spotwelding equipment is hardly possible as special equipment may be designed to reach relatively inaccessible places. It may be said the larger the parts welded the less positive of results. For this reason, spot welded parts of aluminum alloys should be small and easily accessible, not only from this basis but from a cost standpoint.

Spotwelding is cheaper than riveting where the work is open and accessible and where it can be accomplished without frequent changes in tools and setup. Cost studies indicate a saving in labor of about one third over similar riveted construction at Consolidated where riveting is a serious competitor because most of the work is done with pneumatic tools.

Spotwelding of steel is not subjected to the limitations of aluminum alloys. Stainless steel may be considered an ideal material for spotwelding as the welds are strong in tension, shear and torsion. Cost per weld in steel is much less and size of parts is no limitation as portable welding tools may be used.

Table 1

Spotweld Data

Thickness Inches	Min. shear Strength Per Spot	Design Strength Shear per Spot	Pressure on Electrodes in lbs.	Time in Cycles
24ST ALCLAD				
0.020	160 lbs.	150 lbs.	200	3
0.030	240 lbs.	160 lbs.	300	
0.040	320 lbs.	215 lbs.	400	to
0.050	400 lbs.	265 lbs.	500	
0.060	480 lbs.	320 lbs.	600	10
52 SO ALLOY				
0.020	95 lbs.	65 lbs.	200	3
0.030	145 lbs.	95 lbs.	300	
0.040	190 lbs.	125 lbs.	400	to
0.050	240 lbs.	160 lbs.	500	
0.060	290 lbs.	190 lbs.	600	10
STAINLESS STEEL (18-8)				
0.005	140 lbs.	90 lbs.	100	Less
0.010	280 lbs.	165 lbs.	125	
0.015	430 lbs.	285 lbs.	150	
0.020	575 lbs.	380 lbs.	175	than
0.025	720 lbs.	475 lbs.	200	
0.030	860 lbs.	570 lbs.	225	
0.035	1000 lbs.	665 lbs.	250	6
0.040	1140 lbs.	750 lbs.	275	
0.050	1420 lbs.	940 lbs.	325	
0.060	1710 lbs.	1130 lbs.	375	

NOTES

1. Minimum shear per spot is based on the formula t(T.S.)/7=shear per spot where t = sheet thickness; T.S. = tensile strength.
2. Design strength is 2/3 of minimum shear of single spot values.
3. Pressure may be varied to minus 20 per cent from recommended values.

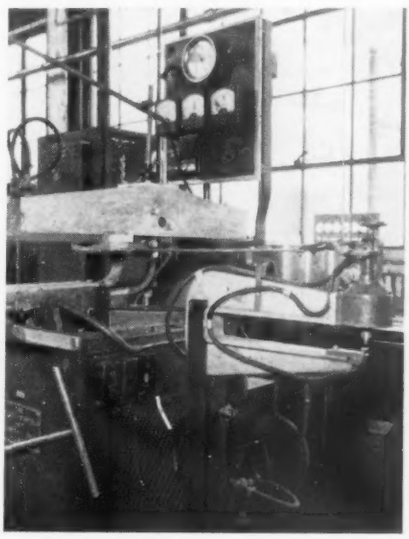


Fig. 4—Small steel welder built alongside large welding machine. Control switches and control instruments are mounted on large welder as shown

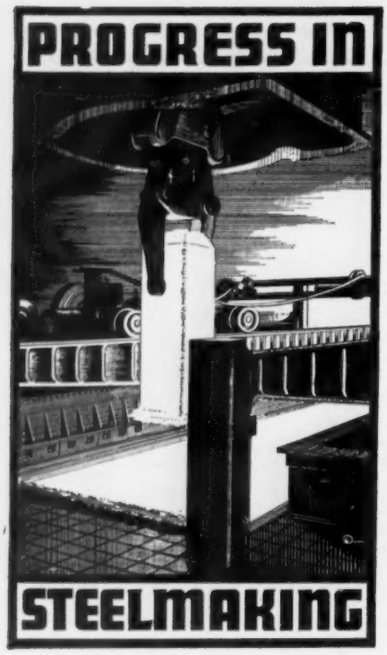
When ships are built large enough to warrant the use of stainless steel we may find row after row of spotwelding equipment.

Alclad alloys are more difficult to spotweld than the plain alloys because of the difference in melting point of the aluminum coating and the parent material. Pure aluminum has a higher melting point and does not break down as completely as the alloy, making an irregular weld. The aluminum coating lowers the contact resistance necessitating higher current settings to effect a weld, with a coresponding loss of tip life, due to excessive pickup.

The 52S alloy appears the ideal aluminum alloy for spotwelding but it has low strength and cold working properties. Several sheets of varying thickness may be spotwelded simultaneously, but in aluminum alloys a wide variation in gage thickness is impractical as the thinner sheet is over heated and there is poor fusion with the thicker sheet. The limit of thin to thick that can be safely welded is in the ratio of 1 to 3. On steel the ratio can be much greater.

Shear strength per spot will vary plus or minus 20 per cent from the mean in the alclad alloys and somewhat less for the plain alloys. This spread of strength values will vary with different equipment and methods used to spotweld. This data has been garnered from laboratory actual variation in production work samples under ideal conditions and may be more.

(Please turn to Page 76)



Furnace Charge Descent

Improved furnace operation by ability to carry air temperatures above 1600 degrees with uniform blast pressure and stock movement may result from using new tuyere having 22½-degree lateral angle

By A. J. BOYNTON
Vice President
H. A. Brassert & Co.
Chicago

■ POSSIBLY the most important single fact ever definitely established with respect to the blast furnace is the disappearance of oxygen in the furnace gases at a maximum distance of 40 inches from the tuyere eye. Prior to this disclosure by the bureau of mines, there was no definite opinion as to the volume within which carbon was burned, and the word "penetration" was used with wide variation as to its extent. The idea was not uncommon, however, that the mass of the charge in a normally working furnace descended uniformly across the diameter of the furnace.

Even before the combustion volume was determined by the bureau, evidence was abundant that this is not the case. If the furnace is blown down 10 feet without filling, a cone with apex at the top begins to form. Twenty feet above the bosh, this cone is well formed and at the bosh is as steep as the angle of repose of the material will permit. All of this indicates a maximum descent at a point immediately above the tuyeres of the furnace.

Corroboration that downward descent of stock takes place chiefly above the tuyeres is the time required to bring extra coke to the tuyeres. Shortness of this period is sometimes masked by a desire to increase the temperature of iron coming from the hearth. This takes much more time than is required to bring coke to the tuyeres, which may be done in about half the time required to bring down the whole volume of the furnace.

In removing brickbats through the tuyere breast of a furnace when a lining was being removed, I have noted the movement of the brickbats from a swinging scaffold in the furnace when height of the brick was ten feet above the bosh. Additions were continuously being made to the brick pile from brick taken from the inwall. Under these circumstances, a "dimple" appeared in the mass of brick bats over each tuyere, and the movement could be distinguished as maximum directly over the tuyeres with each little downward movement. Other investigators have seen the same "dimples" in the coke surface of a furnace blown down nearly to the mantel. Further evidence is furnished by the well-known necessity of keeping ore away from the furnace center and by the cold hearth which follows if the ore charge is so large that a considerable proportion is deposited in the middle section of the furnace.

These considerations afford a basis for figuring volume of the furnace in which movement is active, as distinguished from that in which it is sluggish. An inert cone of coke in the center of the furnace is visualized by all students of the blast furnace but there is much difference of opinion or uncertainty

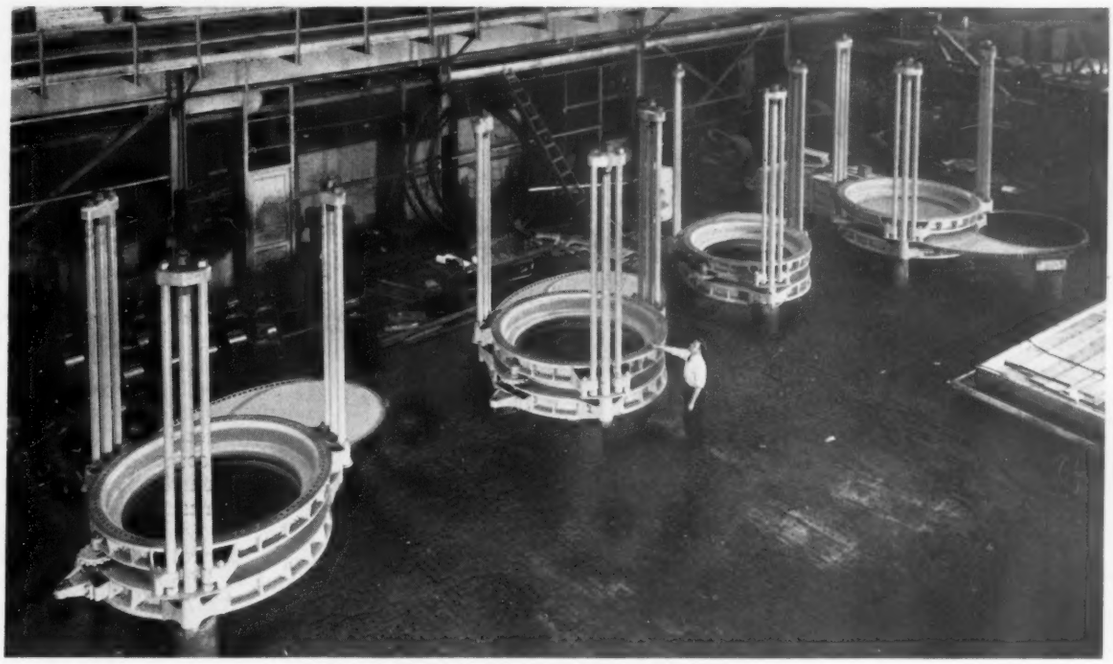
Small Tool for Big Job

■ **Not all portable grinders are used on light work. Here the operator is removing irregularities from a huge, solid steel frame of a press brake at plant of Cincinnati Shaper Co., Cincinnati. This section is 5¼ inches thick. The abrasive operation prepares the surface for application of the standard machine tool gray**

QUALITY

IN DESIGN AND CONSTRUCTION

Have Made These Valves THE STANDARD FOR BLAST FURNACE GAS MAINS



Four of the sixteen large valves (72" to 96" in diameter) shipped this month to India for installation in Blast Furnace Hot Gas Mains

Our Gas Valves have proven their Quality in design and construction, extreme simplicity in operation and low upkeep and operating cost. In one plant eight valves were installed in 1927 and the operating officials advise us now that not one dollar has been spent on these valves and their operation has been entirely satisfactory.

THE THERMAL GAS VALVE

A BASICALLY SOUND IDEA . . .
EXPERTLY ENGINEERED . . .
SIMPLY DESIGNED . . .
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WILLIAM M. BAILEY COMPANY

PITTSBURGH *ENGINEERS* PENNA., U. S. A.

as to the height and slope of this cone.

When Mesabi ore was first introduced in considerable quantities, a new phenomenon was observed known as the "top slip" and characterized by large volumes of black dust proceeding from the furnace top. This was ascribed to "carbon deposition" and a consequent considerable increase in ore volume. It is doubtful whether this increase in volume operated to swell the charge in the top of the furnace as a mass. It seems more likely that the interstices between the pieces of coke were filled and the movement of the coke on itself made more difficult by the presence of the deposited carbon. Even so, it would seem impossible for the charge to bridge itself across 20 feet or so of furnace diameter unless support were afforded by a central mass of stationary or slowly moving coke which extended well up toward the furnace top.

Aside from the support afforded the moving charge along the walls, it seems reasonable to suppose that additional support is provided by columns of coke extending radially from tuyeres to the central mass of stationary coke. Their existence is predicated on the work of the bureau and of other observers, although they have made no statements with regard to the existence of such columns. They find no carbon dioxide or oxygen midway between the tuyeres.

Conclusions Drawn

However, certain tentative conclusions may be drawn from the projection on the tuyere plane of the horizontal space within which coke burns. The diameter between the tuyere noses of a nominal 26-foot hearth with 16 tuyeres may be taken as 24 feet. Distance between adjacent tuyere noses is 4.71 feet. Distance between radial lines through adjacent tuyeres at a point 40 inches from the tuyere nose is nearly 3.4 feet. Width of local combustion volume in front of each tuyere is probably considerably less than 40 inches, since the velocity of air through the tuyeres tends to increase its radial length while the disposition of gases to seek a point of lower pressure leads to movement upward but not sideways.

Result would be a pier of coke which may be 2 feet wide between adjacent tuyeres. Their height, however, is probably not very great since the coke immediately above the combustion space is loose and in rapid descent, and consequently is less capable of preventing movement of coke in these radial piers than would otherwise be the case. However, their presence seems likely to effect stock descent.

Thus, it appears that stock movement is largely within an annular volume adjacent to the walls until a depth is reached at which furnace diameter is equal to that of the hearth. Below this point, descent is less close to the wall although its effects on the brick work, due to increased temperature, are more severe. Descent to the tuyeres is through an annulus which becomes something like a circular system of funnels as the tuyeres are approached.

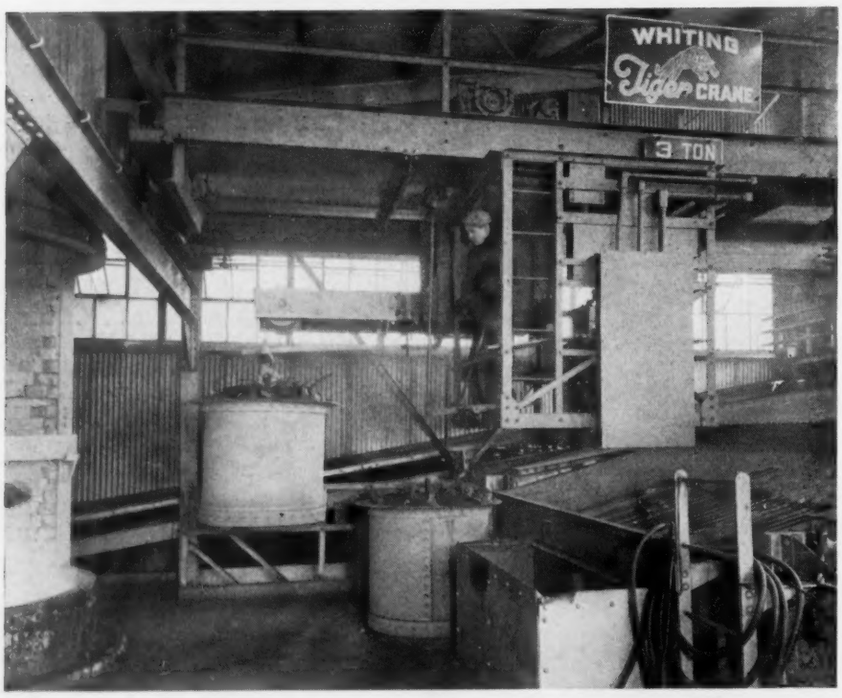
The above attempt at description applies only to the descent of a charge in a furnace which is working correctly. In such a furnace, all the slag forming elements as well as the iron descend in the outer annulus. Any incorrect burdening, whether resulting from lack of skill or economic difficulties increases the resistance to easy downward flow. This flow should take place a little at a time, one piece following another as room is made below. When the bosh slags become stiff and descent of the kind just described becomes slow, the descent of material further toward the center of the furnace increases its rate.

This movement is facilitated by the comparatively small amount of slag-forming elements and iron within the mass of coke. Coke will thus be fed continuously to the tuyeres with no perceptible movement at the stock line. After a while the void created permits a general movement with or without slacking the blast. A hearth too small or a burden which makes a refractory slag at the temperature suited to the production of iron desired leads to continuous irregularities of the kind mentioned, and possibly to permanent adhesions to the walls, although the present-day large hearth makes the occurrence of these much less frequent than formerly.

Slag Composition Important

These circumstances have considerable bearing on the value of a desulphurizing process which permits the furnace to be burdened for a slag to suit operation, rather than for a quality of product obtained at the expense of the operation. The first necessity for successful blast furnace operation is a smooth and uninterrupted descent of the charge. Given a correctly designed furnace and reasonably good preparation of stock with respect to size, chief factor in such smooth descent is a slag of a character and composition which can become thoroughly melted and fluid in the region of the furnace which lies between a point a little above the head of the bosh,

Facilitates Cupola Charging



■ **Although cupola charging is admittedly one of the hardest and most disagreeable of foundry operations, it is said that about 9 out of every 10 cupolas are still being charged by hand. However, Kelsey-Hayes Wheel Co., Detroit, uses this 3-ton wishbone underslung type charging crane in cupola operations to eliminate exposure of charging crew to excessive heat, smoke and carbon monoxide fumes. Photo courtesy Whiting Corp., Harvey, Ill.**

and the point shortly above the tuyeres where the coke begins to burn.

It is to be remembered, however, that slag which runs out of the cinder notch or tapping hole is not the slag which forms on the bosh. The latter has lost most or all of that part of the silica which is reduced to form silicon in the pig iron, and it has not yet received the silica and alumina of the coke ash. At the same time, it contains all the lime which it is capable of absorbing at the temperature and since lime is always in excess at this point, the slag is held to a changing composition which is barely liquid at the continuously increasing temperature. With a slag composition due either to high alumina in the ore or excessively high ash in the coke, the bosh slag may be so refractory as to make the reduction of limestone in the burden and the substitution of desulphurizing treatment outside the furnace well worth undertaking.

Operation with refractory bosh slags is known to prevent the full application of hot blast. The reason for this may be that increased temperature on the bosh reduces silicon from the slag and makes the latter more basic, or it may be that calcium ferrite existing in the slag is decomposed by the increased temperature due to the hot blast, with reduction of the iron and a requirement by the lime for chemical satisfaction. Or, it may be that other circumstances form the true or predominating cause.

Acid Slag Desirable

Whatever the cause may be, the fact remains that a furnace makes more iron with less fuel as the bosh slags become more acid, up to the consistency of charcoal slags. One of the chief reasons for this is the increased applicability of hot blast. With an acid slag, neither of the causes cited above apply to prevent the use of blast temperatures as high as the stove equipment can generate. It seems probable, therefore, that even though furnaces operating with favorable raw materials continue to operate as at present, furnaces with refractory ores or high ash coke, or possibly furnaces located in a moist climate, may derive positive economic benefit by treating sulphur in part as silicon, manganese, phosphorus and carbon are treated; that is, outside the furnace.

A second possible method of improving the furnace operation is by means of a tuyere which is capable of increasing the area within which the coke is burned, thus increasing the ease with which stock may descend to the tuyeres. Many attempts have been made to depart from the straight tuyere, but generally speaking with indifferent success. The latest variation has been developed by Carl Steinbacher, Portsmouth, O. This presents a lateral angle of 22½ degrees. It has been gradually developed over a period of two years and has, in Mr. Steinbacher's opinion, produced improvement in the operation, chiefly through ability to carry blast temperatures above 1600 degrees with no difficulty and with a uniform blast pressure and regular movement of stock.

These facts are remarkable only for the improvement they show over the conditions existing in a furnace now 5 years old. No judgement can be formed as a result of this single trial, but the results so far attained are noteworthy and their verification on other furnaces is easily obtained. It would seem that any difference in practice arising from the use of this tuyere must result from change in the coke piers between the tuyeres to permit a more free and easy descent of the furnace charge.

New Type Roof Made by Welding

■ BY ELIMINATING shop preparation of materials and by cutting down the time required for a job, Harvey W. Schick, Inc., Chicago, estimates that electric arc welding saves approximately 50 per cent in the construction of its special type roofs and floors. The Schick method of floor and roof construction involves the placing of long, shallow pans over the structural steel supporting members, welding these pans together and to the supporting beams, and, finally, filling the pans with concrete. See accompanying illustration. The method results in a stronger and more rigid job, with a saving in cost and time, it is claimed.

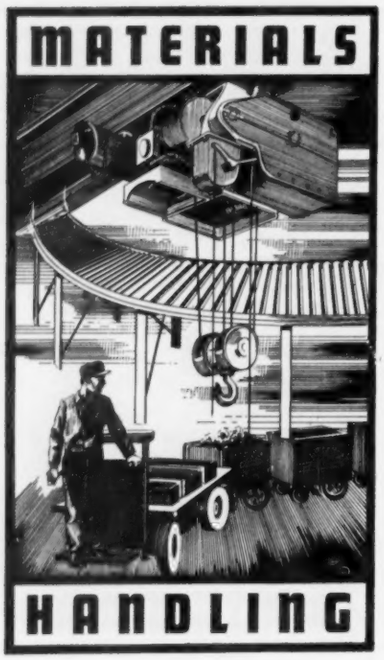
The individual sections, or "pans," are pressed into shape from prime hot-rolled sheets. They are bent uniformly to size, and variation in height of sides or ribs does not exceed 1/32-inch. When pans are laid side by side over the supporting members of a roof or floor, these ribs form I-beams at their intersections.

Electric arc welding of the roof sections to the steel framework of the building prevents any rocking or vibration between the floor system and the framework, gives practically a fixed end bearing for the sections and provides lateral bracing for floor beams or roof purlins. It also makes possible the placing of this type of deck over beams having a different pitch or over warped surfaces where the cost of building wood forms for a reenforced concrete slab would be prohibitive.

The sections do not require any intermediate supports during the time the filling is being placed. Bricks have been piled two feet high on 12-foot span sections before the filling was placed without any noticeable deflection and without damage to the sections.

Previously, the company used a bolted construction or one involving the use of rivets. These methods, however, necessitated punching bolt or rivet holes and were found to involve more work.

"Ipan" roof construction being fabricated on Link-Belt Co. building in Chicago. Formed steel sections are joined and welded to supporting beams by arc welding. Photo courtesy General Electric Co., Schenectady, N. Y.



Foundry Sand System

Completely mechanized delivery, collection and reconditioning of sand is accomplished by simple arrangement of belt conveyors, bucket elevators and auxiliary equipment

By L. COLBY
Barber-Greene Co.
Aurora, Ill.

■ A MODERN SYSTEM for handling and treating foundry sand was recently installed by Marshall Stove Co., Lewisburg, Tenn. In general, this complete installation stores foundry sand, conveys it to many small hoppers within easy reach of the various molders, collects the sand after casting, reconditions it and feeds it again into the central storage system, continually repeating the above cycle.

The installation consists essentially of 13 belt conveyors, four apron feeders, four bucket elevators and numerous hoppers, a vibrating screen, muller and a paddle mixer.

Perhaps the best point from which to follow operations is from the hopper where sand is stored. This hopper contains about 125 tons of sand and has a gate at the bottom which can be regulated to control the amount of sand that the feeder, which is underneath the hopper, takes out. This feeder is located in the basement and empties into a bucket elevator which elevates the sand to the roof. Here it is discharged on to a 8 x 12-foot screen which is vibrating 1200 times per minute, clearing out sand balls or any foreign material that may have gotten into the material.

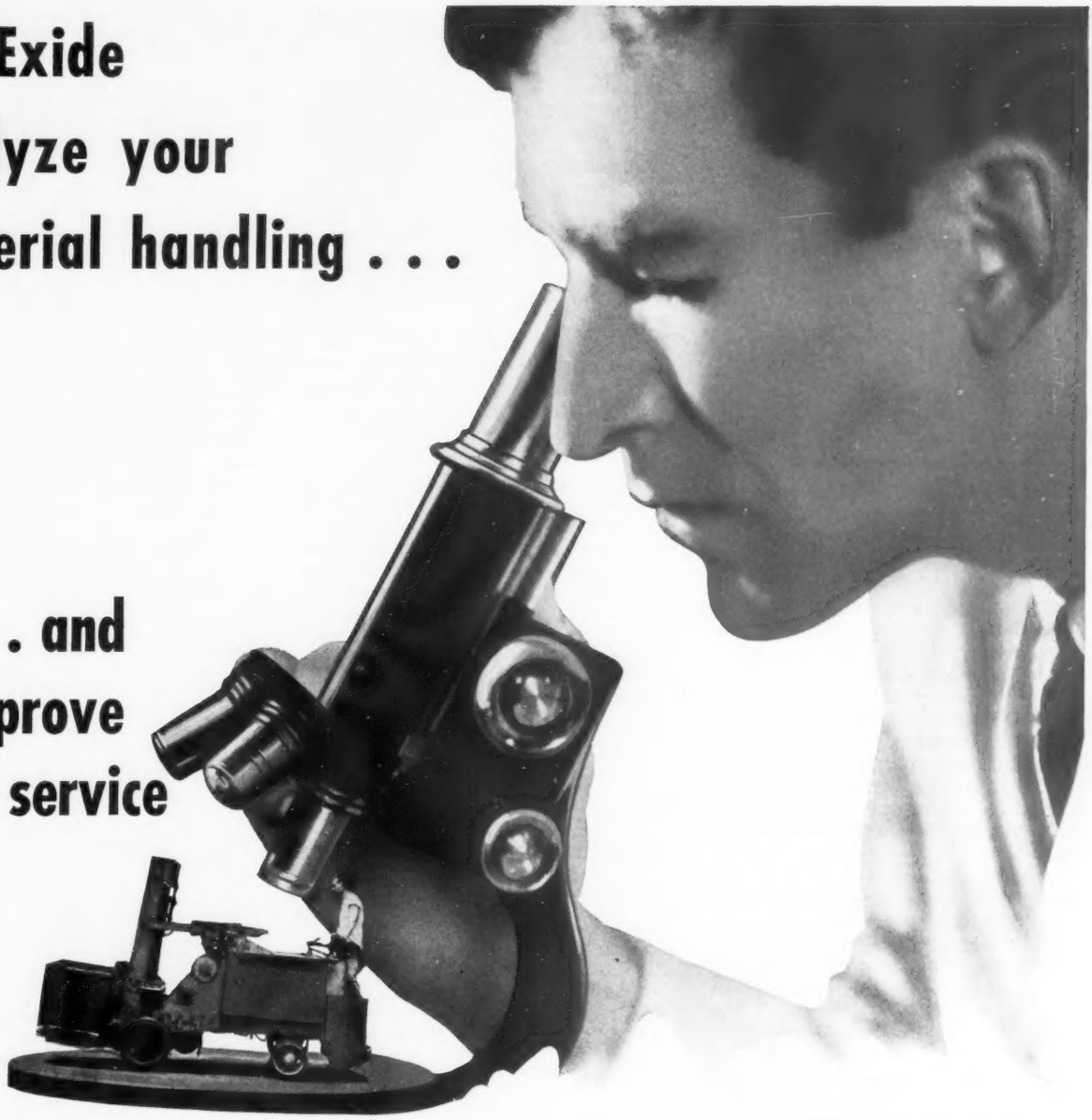
Sand then is discharged onto conveyor N which is the tempering belt. This is a flat belt 30 inches wide and 30 feet long. Water sprays are placed over it and sixteen 4-inch plows located near these sprays roll the sand over so the water can spray evenly through all the material. This tempering belt discharges into a paddle mixer somewhat similar to a pug mill. This machine churns the material up to get an even distribution of water through it.

Carries Sand to Muller

Material next passes on to conveyor O which carries it up into the muller. This is a rotating device with loose rings hung in it. Centrifugal force causes these rings to roll the sand out through a grating on the outside of the muller where it drops down onto conveyors U and K. The amount of material that is to go to either conveyor is controlled by a flop gate; one conveyor taking it to the east system and the other to the west system. Conveyor K going to the west sys-

Fig. 1 (Top)—Conveyor T is one of two overhead conveyors which carry sand to hoppers. A counter-weighted V-plow located over each hopper takes sand off as required. Fig. 2 (Bottom)—Conveyor S does same job on opposite side of foundry

Let Exide analyze your material handling . . .



. . . and improve your service

A CAREFUL analysis and study of the material handling jobs in your plant may show that a surprising improvement can be made in some of these handling jobs. Exide now has a testing unit and an odometer, which permit every material handling job to be analysed quickly and accurately.

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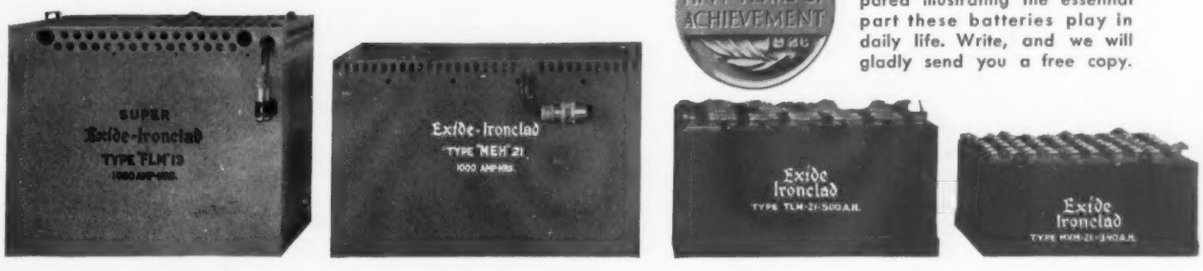


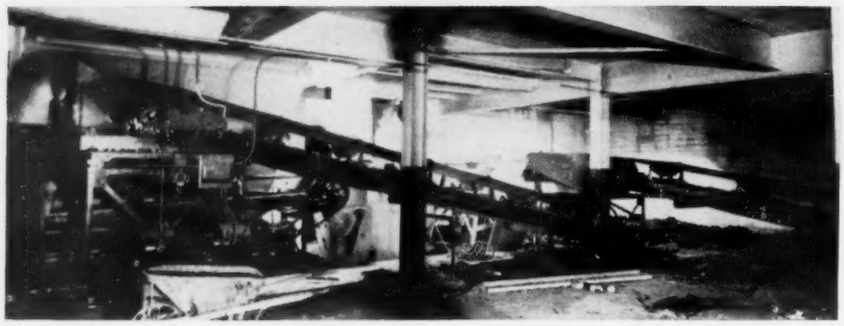


Fig. 3—Underneath foundry floor, conveyor C runs crosswise the foundry and gathers hot sand shaken from castings. It feeds conveyor J which dumps into elevator No. 1 returning sand to storage bin

tem empties into a bucket elevator which raises the material to the roof and discharges onto conveyor P. This unit carries it across the building to the west side where it discharges on conveyor S.

Conveyor S is a flat roll belt with 21 V-plows or belt sweeps located on it over hoppers that hold about three tons of sand each. These plows are counterbalanced so they are not operating unless held down. A man is stationed on a walkway here and he holds the plows down to take sand off into these hoppers as required.

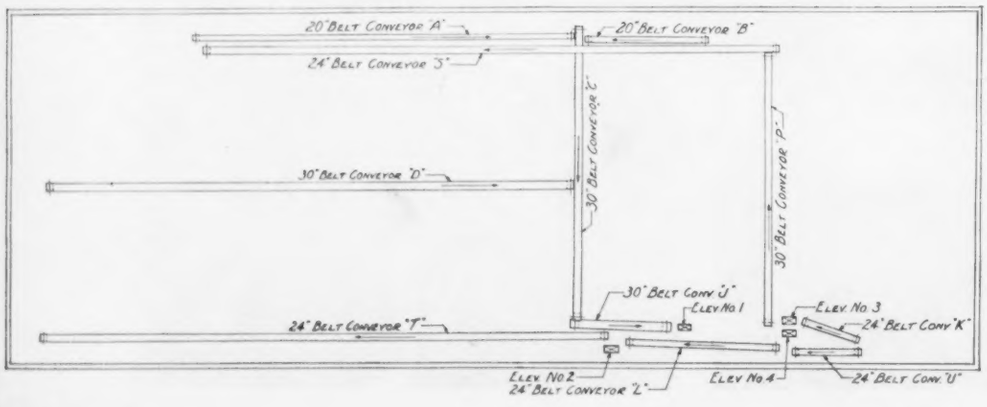
Directly under these hoppers are the molding machines. The molder simply moves a lever to get sand. Any spillage from the hopper or from the molding machine drops through the grating in the floor onto conveyors A and B which run in a tunnel in the basement underneath the molding machines, taking the material onto conveyor C which is a cross belt. Finished molds are carried by the mold conveyor to the men who pour the iron, and then without stopping to the shakeout screen.

By the time castings reach here, they are cool enough to permit dropping them onto screens to shake the castings loose from the molds. The hot sand drops down through grating in the floor onto a feeder in the basement which carries it to conveyor D.

This conveyor, running in a tunnel underneath the foundry floor, has a long continuous hopper over it into which the molding sand from the larger castings on the east side of the building and any special hand molds are dumped. It carries the hot sand back onto conveyor C which is traveling across the building. It also collects sand from conveyors A, B, D and discharges this sand on conveyor J.

(*Please turn to Page* 75)

Fig. 4—Layout of conveyor and elevator systems in foundry of Marshall Stove Co., Lewisburg, Tenn.



Kent's Handbook Issued In Eleventh Edition

■ *Kent's Mechanical Engineers' Handbook—Design and Shop Practice,* fabrikoid, 1400 pages, 5 x 8 inches; published by John Wiley & Sons Inc., New York; supplied by STEEL, Cleveland, for $5; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W.1.

This eleventh edition of a well-known work first appearing in 1895, practically has been rewritten in keeping with changes in the mechanical world. The present edition has been prepared under supervision of Robert T. Kent, as editor in chief, with collaboration of a staff of specialists.

Encyclopedic scope of the work may be gathered from headings of the 28 sections under which the enormous mass of material is presented: General Properties of Materials; Iron and Steel; Corrosion and Corrosion Resistant Materials; Nonferrous Metals and Alloys; Nonmetallic Materials; Fabricated Materials; Strength of Materials; Mechanisms and Mechanics; Fastenings; Mechanical Springs; Rotating Members; Keys, Cotters, Pins, Tapers and Fits; Bearings and Lubricants; Gearing; Control Mechanisms; Vibration and Noise; Structures and Buildings; Industrial Heating Processes; Forging Practice; Foundry Practice; Machine Shop; Woodworking; Materials Handling; Mechanical Power Transmission; Electric Motors and Their Control; Miscellaneous Shop Equipment; Safety Engineering; Mathematical Tables.

Each section carries its own sequence of page numbers, and the book is provided with an exceptionally complete index of 78 pages.

Separates Sand from Castings in Large Molds

■ Speedily and economically separating sand from castings in large molds, a new machine in the Everett steel foundry of General Electric Co., Lynn, Mass., raises and drops a 20,000-pound mold 83 times per minute.

Sand is shaken out and drops through a grating. Before installation of this new equipment large molds were picked up by crane and castings were dug out laboriously. Machine is all-welded in its construction and is powered by a 20-horsepower geared motor that rotates a heavy shaft. Three cams on this shaft lift and drop one end of the shakeout beams. These beams are formed of 24-inch plates welded to both flanges and web stiffeners every two feet.

Equipment was designed by General Electric maintenance and engineering department in co-operation with its foundry organization.

Outlines Tests for Acid Resistance of Enamels

■ Porcelain Enamel institute, 612 North Michigan avenue, Chicago, has announced publication of a revised edition of the handbook known as "Test for Acid Resistance of Porcelain Enamels."

This publication was prepared under direction of the institute's committee on standardization of tests. Included in the manual are complete instructions under each classification for simple methods of determining acid resistance of porcelain enamels. Copies may be obtained from institute headquarters at Chicago.

Study Foundry Technique At Missouri Conference

■ PROBLEMS connected with production of steel, malleable gray iron and nonferrous castings, were considered at the second annual foundry conference at Rolla, Mo., Oct. 7-8, under joint sponsorship of the St. Louis district chapter of the American Foundrymen's association and Missouri School of Mines and Metallurgy. The attendance of 150 represented a large number of plants throughout the Southwest.

A paper on blowholes in steel castings, by Joseph D. Walsh, Scullin Steel Co., St. Louis, and another on manufacture of steel castings for oil refinery service, by L. E. Everett, foundry superintendent, Key Co., East St. Louis, Ill., featured the steel foundry session.

Mr. Walsh referred to 34 separate items responsible for blowholes. These were grouped under the following general heads: Molds and cores, sand, binders, rust, chills and chaplets. In many instances, workmen either through ignorance or carelessness produce molds that inevitably will blow when filled with molten steel. Vigilance and generous instruction on the part of the foreman are necessary to overcome this. The speaker claimed the human element still to be one of the most important to be considered in the production of castings. Selection of duly qualified men is just as important as the selection of proper material and equipment. The first human element in the foundry is the foreman who must be broad enough and clear enough of vision to keep in touch with progress and development.

Design Responsible

Mr. Walsh directed attention to the fact that in many cases design of the casting is responsible for certain defects including blowholes. A casting filled with complicated cores presents a hazard in that suitable passages for the escape of gas cannot be provided. The designing engineer should be open minded enough to accept suggestions from the foundryman and if necessary change a design to facilitate production of the casting in the foundry.

Mr. Everett observed that steel castings employed in the oil industry usually are exposed to extremely severe service conditions. Fittings are demanded to operate at temperatures up to 1050 degrees Fahr., and at pressures up to 2000 pounds per square inch. At the other extreme in the dewaxing of oils, fittings must withstand temperatures as low as minus 75 degrees Fahr. at the same pressures. In an extreme instance, the speaker referred to a French plant for which his company had furnished fittings designed to operate at a temperature of 1250 degrees Fahr. and at a pressure of 5400 pounds per square inch.

The speaker claimed that the steel foundry has been so close to the metallurgical developments in the oil refining industry that most of the alloy steels for the purpose are as successfully cast as forged. Some of the newer alloys are available only as castings.

Chemical analysis must be restricted to close limits. Thoroughly degasified metal minimizes appearance of pin points, gas pockets, etc. Pouring practice is extremely important. Fettling and cleaning practices must be set up and adhered to carefully. Most of the alloys are extremely susceptible to air hardening and may crack if subjected to intense localized heat. Heat treatment is of prime importance. Inspection of this class of castings is unusually minute and thorough.

Size of gates on the castings is regulated to a predetermined cross sectional area to serve as a metering orifice. For example, flanged fittings up to 1000 pounds in weight use a gate in which the cross sectional area in square inches is equal to 0.09 of the square root of the weight of the casting. Molds are made from a comparatively weak sand, 2.0 pounds green shear strength, 5 to 6 pounds green compression, and 40 pounds dry compression, moisture content 1.8 to 2.2 per cent and permeability 300 or more.

"Malleable Iron Castings—Manufacture, Properties and Uses," was the title of a paper presented by L. J. Wise, Chicago Malleable Castings Co., Chicago, at a malleable session. The speaker pointed out that about half of the total malleable iron production is used by the automotive industry and the remainder for agricultural implements, railroad equipment and a wide variety of miscellaneous uses including pipe fittings, lawn mower parts, stadium seat brackets, washing machine parts, lamp brackets, bridge railing, etc.

Hyman Bornstein, Deere & Co., Moline, Ill., speaking on "Short Cycle Anneal," pointed out that the metallurgical basis for shorter annealing periods for malleable cast iron had been known many years. The long annealing cycle used in the usual periodic oven was due to limitations of equipment. Occasionally smaller ovens would be used or packing materials would be eliminated. Both schemes would result in cutting down the annealing cycle.

Development of the radiant tube furnace has given the malleable foundryman a tool with which he can obtain a shorter anneal. A metal which would anneal in 7 days in the periodic oven, can be annealed in less than 60 hours in the radiant tube furnace.

Composition a Factor

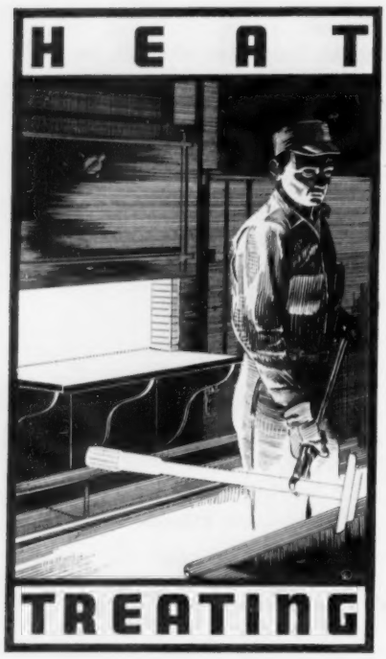
Composition is important and affects annealing. Increase in silicon has marked effect on reducing time. On production runs in the radiant tube furnace, a metal of 1.00 per cent silicon has been annealed in 52 hours, 1.20 per cent silicon in 30 hours and 1.75 per cent silicon in 14½ hours. This type of furnace permits control of atmosphere and a definite atmosphere is introduced to prevent scaling and to minimize decarburization.

The author's company during the past year has done experimental work to determine optimum cycles for various compositions, effect of silicon on annealing, effect of various furnace atmospheres and effect of various rates of heating to the maximum temperature.

James H. Lansing, shop practice engineer, Malleable Founders' society, Cleveland, discussed the importance of malleable iron castings in the industrial field. Mr. Lansing used slides to show a wide variety of malleable applications in the automotive, railroad, and miscellaneous fields.

Discussing the "Limitations of Foundry Refractories," M. C. Booze, Charles Taylor Sons Co., Cincinnati, stated that temperatures, rates of melting and refining, slag composition, and other factors must be held within the bounds of safety and economy relative to the furnace lining. Because of urgent demands for better refractories, more important developments have taken place in that field during the past decade than ever before. New types of products are available and great improvements have been made in the commonly used refractories.

The speaker discussed the various factors such as shrinkage, spalling, thermo-spalling, and slag erosion which effect the life of refractories. He presented valuable information on the properties of various types of refractories and indicated the improvements which may be secured in furnace life through design and manipulation.



Spring Washers

Increased severity of service conditions entails adequate heat-treating procedure for spring washers. Practice of one manufacturer is outlined here

■ SPRING WASHERS are being called upon to withstand different service conditions. Modern assembly line operations employ the use of power wrenches, nut runners and similar equipment to facilitate operations. These impose more severe service on the spring washers used in these assemblies and emphasize the importance of adequate heat treating procedure in manufacture.

Practice of Philadelphia Steel & Wire Corp. in making spring washers in its Philadelphia plant involves use of a fine-grained spring steel between 0.60 to 0.70 per cent carbon. Before fabrication, it shows a hardness between 20 and 25 Rockwell C. It is received in the form of hot-rolled rounds and shapes and is cold drawn to the various sizes of keystone wire required for the fabrication of Neverslip spring washers.

Some of the smaller sections require as many as 8 to 10 passes through wire drawing plates. The wire is given a spheroidizing treatment between each pass to produce a globular condition of the carbide. Temperature of approximately 1300 degrees Fahr. is employed. A keystone cross section is required to compensate for change in cross section produced during the coiling treating procedure in manufacture.

Drawing dense load of small spring washers in air-tempering furnace. Photo courtesy Leeds & Northrup Co., Philadelphia

Performs Dual Operation

The cold drawn keystone wire is fabricated into spring washer form on specially designed machines which, in addition to coiling, automatically sever each convolution. By coiling the keystone wire with the narrow side adjacent to the mandrel, the narrow side thickens and the wide side thins so the resulting cross section is rectangular. Inside diameters of the spring washers produced vary from 0.098 to 4 inches and the cross-sectional dimensions of the wire include the range from 0.022 x 0.022-inch to ⅝ x ⅜-inch. Weight varies from a few ounces to several hundred pounds per thousand pieces. Inside diameters are held to plus or minus 0.005-inch tolerance on small sizes while in sizes for larger bolt diameters the tolerances may run as high as 1/32-inch.

After fabrication, the spring washers are hardened in rotary-re-

tort type gas-fired furnaces. These are closely muffled so there is no chance for intake of atmosphere. Burners are arranged so the heat input can be controlled throughout the entire length of the cast Nichrome retort. Temperature within the retort is controlled automatically.

At the discharge end of the furnace the work passes through an oil-sealed chute into a rotary quench drum without coming into contact with the atmosphere. This makes it possible to hold decarburization and scaling to a negligible minimum.

After oil quenching, fracture and hardness tests are made at close intervals to determine grain structures and to assure maximum hardness prior to tempering.

Following these checks the material passes through a wash to remove all traces of quenching oil. Then the spring washers are drawn in a dense load Homo forced-convection air-tempering furnace shown in the accompanying illustration. In this particular view, 700 pounds of 3/16-inch spring washers are being handled. It requires less than one hour to draw this load in this electric furnace.

Provides Uniform Heating

The hot air, forced in one direction by means of a powerful fan, driven by 3-horsepower motor provides uniform heating throughout, regardless of density of load.

To insure uniform rate of heating, the furnace is equipped with automatic controls which can be set to regulate the input of current according to the nature of the load. Readings taken at five different points in dense loads made up of small spring washers such as the load illustrated have shown less than 5 degrees variation between any two points in the load. Drawing temperatures range between 500 and 700 degrees Fahr. depending upon analysis of material and other factors. Hardness produced varies between 48 and 53 Rockwell C.

Each lot treated receives several tests including a fracture test after tempering. Also hardness readings are taken from each lot to insure the required uniformity.

Spring washers so produced have the necessary stamina to withstand increased speed and thrust of power wrenching, although the cross sectional dimensions of standard spring washers are approximately the same as when wrenching of nuts was done manually.

There is a tendency in many cases to use spring washers too light in cross-sectional area to provide adequate tension in the bolted assemblies, although engineers are giving increased thought to the selection of spring washers suitably proportioned for the service they must perform.

Develops New Test Furnaces

■ NEW TEST furnace, recently developed by P. G. McVetty, Westinghouse research laboratories, East Pittsburgh, Pa., in effect combines 60 creep machines into a single unit. With three of the new furnaces in operation, it will be possible to conduct 180 simultaneous tests. Each machine is a heavy alloy steel block housed in a three-walled cylinder more than 6 feet high and supported on a sand foundation. To retain heat inside the furnace, the outer shell is made of concentric sheets of polished nickel and aluminum separated by powdered silocel. Sand was used in the 6-foot deep foundation pit because of its ability to minimize the effects of vibration which are known to hasten the creep of metals. To keep the sand warm and dry, the pit has its own electrical heating unit.

Three electric windings on the metal core of the furnace produce temperatures up to 1000 degrees Fahr. and a photo-electric cell maintains the temperature within 10 degrees or less by automatically operating a resistance which controls the electric current. The cylinder revolves once an hour to distribute heat equally to all parts of furnace.

Each heating core has 12 spaces for holding twelve 20-inch test samples which may be subsidivided into five sections to make 60 tests. Dial gages connected with comparison rods extending through the top of the furnace measure the relative vertical displacement of the rods. Samples may be loaded by weights and levers to a stress of 50,000 pounds per square inch of metal under test.

Three newly completed creep machines simultaneously test 180 alloys at 1000 degrees Fahr.

For a double check the machine has a circular track and a micrometer microscope, or extensometer. A laboratory worker welds two platinum spots or targets at top and bottom of each metal sample, scratches very fine lines on these spots and fastens the metal sample in the furnace. When it is time to take a creep measurement, the cylindrical shell is revolved until the sample is opposite two quartz windows which pierce the 10½-inch wall. The microscope is rolled in place on the track, operator sights through quartz windows and measures the distance between the two platinum targets. Its measurements are accurate within 0.00001-inch.

Readings are taken daily for approximately three months, charting the results as a gradual curve. In three months sufficient data has been accumulated to make it possible to estimate how the metal will creep during the next 20 to 30 years.

Devise Welding Process To Replace Soldering

■ A low-cost resistance welding process of an electronic type has been developed by General Electric engineers to replace expensive soldering operations in the manufacture of such items as radio sets, watches, small meters, industrial control devices, railway signal equipment and business machines.

A current of several thousand amperes flows in secondary circuit of welder for a half-cycle, which is precisely timed by an ignitron tube and its associated control circuit. This circuit includes a dial for regulating heat by the phase-shifting method. Amount of heat is determined accurately by duration of current flow; maximum heat is obtained with a current duration of slightly more than 1/120-second.

Static Charges on Belts Grounded by Graphite

■ Accumulation of static charges on driving belts of machines has been a frequent cause of complaint, as such electrical effects may be dangerous in moist atmospheres, according to Acheson Colloids Corp., Port Huron, Mich.

It has been found that charges can be dissipated by treating belts with an aqueous dispersion of colloidal graphite. This electric furnace product is a good conductor of electricity. Graphite films formed on belts carry static charges from pulleys to frames. Present practice is to apply a suspension of colloidal graphite in water directly to pre-cleaned belts by simple brushing.

Gear Industry Learns More About Combatting Noise

■ PROGRESS in various technical aspects of the gear industry was reported at the twenty-first semi-annual meeting of the American Gear Manufacturers association at Skytop, Pa., Oct. 10-12.

More customers are demanding noiseless gears, with the result the industry now has well-established methods for measuring noise and breaking it into its component factors.

A notable paper on this subject was submitted by Roland S. Davidson, Thomson laboratory, General Electric Co., West Lynn, Mass., and Laurence J. Collins, metal gear engineering department of that company. It described this company's approach on the problem of noise analysis and described a new noise meter which, by analyzing noises and measuring them on a decibel scale, has proved of much practical value.

In several cases noise analyses compared with vibration tests on a gear wheel have indicated advisability of changing wheel dimensions with the result that a gear set with objectionable whistle was made acceptable. In one instance, acceptance of a large gear set was facilitated by tracing an objectionable whistle to the commutator of the load generator used on test.

In another instance a large single-reduction gear with two pinions had an annoying beat, 125 per minute, in its noise. Noise analysis showed a component measured as 660 cycles was beating at this rate. The eighth harmonic of the high pressure pinion rotation was calculated as 666.16 cycles per second and the eleventh harmonic of the low pressure pinion rotation was 664.07 cycles per second, the difference being 2.09 beats per second, or 125.4 per minute. Examination of the hobbing machine on which the pinions had been cut disclosed a slight bending of a shaft in the differential train and it was this bent shaft that had produced the periodic errors resulting in these harmonics.

While such delicate noise meters have real value, said J. O. Almen, Research Laboratories division, General Motors Corp., Detroit, much can be done through the use of simply equipment and ingenuity. As examples, he cited air cleaners and exhaust mufflers on automobiles. These devices in effect are silencers. They are tuned to the vibration of the motor by means of short pipes.

James H. Flagg, Watson-Flagg Machine Co. Inc., Paterson, N. J., warned that the problem of noise cannot always be solved satisfactorily by means of a decibel test of the gearmotor unit alone. An analysis of the various harmonics and compounded sound waves generated when the gearmotor actually is at work in its application is necessary.

Demands from customers for noise elimination of late have reached such proportions, declared R. S. Marthens, Nuttall works, Westinghouse Electric & Mfg. Co., Pittsburgh, as to warrant setting up of an AGMA noise standard. On gearmotors for certain applications, as in the textile industry, said Mr. Marthens, his company uses a simple noise meter, taking six to eight readings in different locations three feet distant from the gearmotor. It employs 70 decibels as the maximum acceptable reading.

Gearmotors Increase

Where few gearmotors were in use prior to 1929, said Mr. Marthens in a comprehensive paper on these units, they now are in wide use and can be applied to almost any drive. A recent survey, he said, shows there are few drives that do not require some kind of speed reduction. Mr. Marthens described many typical gearmotor applications.

Maintenance of gearmotor drives, according to W. P. Schmitter, Falk Corp., Milwaukee, is a matter more of the motors than of the gears. Recent examination of a gearmotor installation in a steel mill drive showed that the gears had worn imperceptibly after two years of continuous service.

Control of general-purpose motors was the subject of a paper by N. L. Hadley, General Electric Co., Schenectady, N. Y. This paper covered controls as well as undervoltage protection, protection by interlocking, overload protection and protection by enclosure. The particularly interesting conclusion voiced by Mr. Hadley as a result of tests was that starting and accelerating torques of general-purpose motors subject the mechanical drive to less strain than generally believed. The operation of plugging a motor at full voltage from full speed forward to full speed reverse, for example, was shown to produce torques that cause no concern.

In discussing this paper Mr. Marthens cautioned that when an overload protection circuit goes to work observation should be made at once so that the cause of the overload may be recognized and eliminated.

A paper by M. S. Hancock, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., was devoted to characteristics of general-purpose motors. He not only discussed the features of motors of different types but told which will meet gear requirements at lowest cost.

Recently the Sear Manufacturers' association organized two new committees, one covering cast iron and its application to gears and the other lubrication of gears. The latter committee, according to H. A. McConville, General Electric Co., Schenectady, N. Y., its chairman, already has ascertained that some current lubrication specifications are undesirable. For instance, the 600W lubricants, frequently recommended, should not be used with gears.

The speed reducer committee has added to its recommended practice a provision covering helical and herringbone speed reducing and increasing gears. It provides that gear manufacturers will assume responsibility for unsatisfactory operation only if the drive has been designed correctly so as to be free of undue variations in torsional vibrations. The speed reducer coimmittee incidentally, hereafter will be known as the enclosed gear drive committee and it will have as subcommittee the former gear motors committee.

Work on chain and sprocket nomenclature has been completed during the past few months. The bevel gear committee is revamping its entire recommended practice. The electric railway gearing committee had added to its recommended practice the tooth proportions of a closed herringbone railway gear. The inspection committee is working on standards for tolerances in gears.

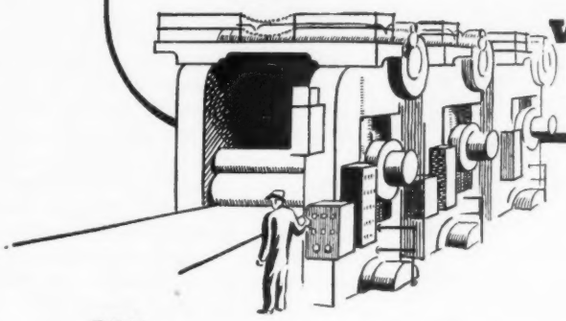
A valuable paper on the application of bronze to worm gearing was submitted by J. A. Hatch, McCallum-Hatch Bronze Co. Inc., Buffalo. This will be published in an early issue of STEEL.

Statistics Forthcoming

A noteworthy addition to the statistical data available to students of the business trend will be contributed by the association, starting in the immediate future. According to announcement by Howard Dingle, president, Cleveland Worm & Gear Co., Cleveland, and president of the association, the latter will release to business publications its statistics covering gear orders.

A plan for training boys to become mechanics was reported by R. C. Ball, president, Philadelphia Gear Works Inc., Philadelphia, chairman of the association's industrial relations committee. It was referred to the attention of the executive committee and may soon become

Get smoother finishes with Birdsboro Rolls



WITH sales departments clamoring for smoother and smoother surfaces, roll mill men have been doing a lot of thinking about ways and means of getting such surfaces. Most of them agree that smooth rolling depends on:

1. Proper control of cooling water
2. Efficient lubrication of roll surfaces
3. Adequately filled passes
4. Proper gripping action by the rolls
5. Ability of roll metals to withstand high friction and pressure while maintaining hard surfaces free of firechecks, spalling, etc.

The first three are your problems, but the last two are ours. Solving those two has required the coordination of many fabricating operations of which one of the most important is known as swirl casting. Here's how we do it at Birdsboro and how you benefit.

Before pouring, each mold is placed in an upright position and carefully gated so that the molten metal will enter the mold with a swirl or whirlpool-like motion. As in a whirlpool, impurities flow to the center and rise into the head. Nothing but clean metal remains in the roll when the head is removed.

Machined, the roll surface shows an even tight-grained structure of uniform hardness. In your mill, that surface remains true longer —imparts to your product exactly the finish you desire throughout the long life of the roll.

Birdsboro rolls are produced by the very latest approved methods and subject to rigid control throughout. Our facilities can handle any type or size. Send us an order and compare length of life and wearing qualities against your present make. Birdsboro Rolls cost no more.

STEEL AND CHILL ROLLS • HYDRAULIC MACHINERY • STEEL CASTINGS • STEEL MILL EQUIPMENT • SPECIAL MACHINERY • CRUSHING MACHINERY

BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY

PLANTS AT BIRDSBORO AND READING, PENNSYLVANIA

operative. Not as comprehensive as the apprentice plans of larger companies, the plan is aimed to produce machinists for smaller companies. It provides for a working course of two years with a scheduled number of hours devoted to various types of machine work.

At the end of the training period the boy is to receive a diploma issued by the American Gear Manufacturer's association and signed by the president of the member company where the boy received his training. Under the plan the boys will be encouraged to attend night school but this will not be mandatory. Suggested compensation for the learners is 25 cents an hour at plants located in smaller cities with a 5-cent increase every six months. Rates may be somewhat higher in the large cities.

An address on flexible budgeting was given by W. H. Compton, William H. Compton & Co., Trenton, N. J. The speaker explained a new type of cost and profit trend chart, applicable to a business of any kind, which shows profit or loss for any rate of operations, thus making it unnecessary for management to guess what its showing will be until some time after the end of the month when the figures have been compiled.

The meeting was enlivened by a human interest address, on the subject of "Buying and Selling" by A. G. Hopcraft, purchasing agent, Cleveland Worm & Gear Co., Cleveland.

Industry is judged by what its employes and customers think about each individual company, and by the attitude of the people who reside in the community in which that company's plant is located, said Col. Willard Chevalier, vice president, McGraw-Hill Co., New York. The popular feeling toward industry in general is the composite of the feeling toward individual companies. The public relations job of industry, therefore, depends on the conduct of each individual company.

Col. Benjamin A. Franklin, industrial engineer and secretary of the Specialty Paper and Board affiliates, spoke on the subject of industrial relations. Three companies to his knowledge have been able to work out a plan of security to their employes, guaranteeing to pay them once a week 48 to 52 weeks a year. They do this by basing pay on a percentage of gross sales. Though the rate of compensation thus fluctuates up and down with the sales curve the men are sure of a pay check every week.

Relations with employes improve with policies which help the worker to save a portion of his wages, that help them through beneficial societies and in other ways. One company gets good results by declaring a dividend for the workers every time it declares one on the common stock.

In discussing human relations, Mr. Dingle declared that industry earnestly is seeking an answer to the problem of reconciling security of the worker with the system of free enterprise and so far the question still is open.

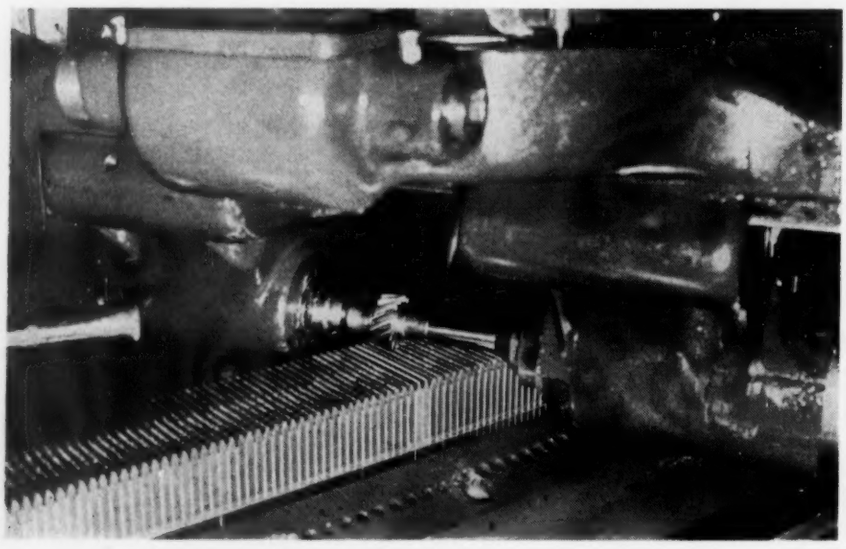
Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is a new member of the association.

Crowning Gear Teeth in Production Proves Simple

■ A SIMPLE but effective method of "crowning" gear teeth in regular production is being used by Warner Gear Co., Muncie, Ind. The method, shown in the accompanying illustration, consists of using two dummy blades in the center of a crossed-axis gear-finishing rack, these blades being ground with a slight transverse taper so that the cutter blades on one end of the rack are angled a few tenths in one direction, and those on the other end a few tenths in the opposite direction.

The objective, of course, is to provide a minutely greater thickness at the center than at the ends of the teeth so as to prevent concentration of tooth loads at the ends resulting from imperfect mating arising from heat treating warpage, unavoidable manufacturing and assembly variations, or possible minor shaft deflections under load.

Two dummy blades ground with a slight taper offset the rack blades in this rack finisher for crowning gears in production



Overdrive Suggests Idea

The idea was evolved as the result of experiences with overdrive gears about 2½ years ago. In one type of overdrive being brought out in 1935, a total variation of 0.0002-inch was found to represent the difference between a good assembly and one too noisy to be acceptable. A special internal gear finisher developed at the time was found to produce gears satisfactory from the noise standpoint as a result of a cutting action which crowned the gear teeth automatically by interference cutting near the ends of the internal teeth.

The next step was to crown the teeth of the pinion which meshed with this internal gear as well as with the sun gear of the planetary assembly, further improving noise characteristics. It was for this operation that the above mentioned rack design was first used.

Discuss Protection of Metal Against Corrosion

■ Four technical papers presented last spring at a meeting of the Detroit section of American Society for Testing Materials have been published in booklet form under the title, "Symposium on Protecting Metals Against Corrosion."

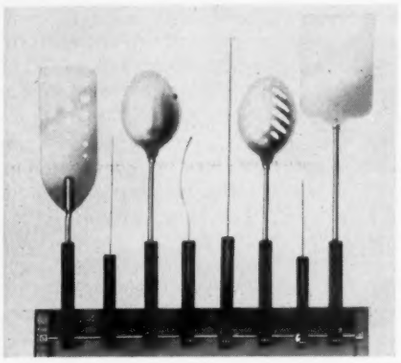
Papers comprising this symposium include one on "Corrosion-Resistant Alloys" by H. W. Gillett, metallurgist, Battelle Memorial institute, another on "Protection of Base Metals by the Use of Metallic Coatings" by C. E. Heussner, material engineer, Chrysler Corp., a third on "The Pre-treatment of Metals" by R. J. Wirshing, research engineer, General Motors Corp., and a discussion on "Corrosion Protection by Means of Organic Coatings" by J. L. McCloud, metallurgical chemist, Ford Motor Co.

Copies of this symposium can be obtained from headquarters of the society, 260 South Broad street, Philadelphia, at 50 cents.

ADVERTISING PAGES REMOVED

NEW METAL PRODUCTS

■ A new aid to kitchen efficiency is found in a "No Fumble" utensil rack just introduced by the Cutlery division of Remington Arms Co., Bridgeport, Conn.



Stainless steel utensils have hard rubber handles with special notches that provide quick, non-slip action for the user. Rack is 12 inches long and 2 inches deep, finished in red, ivory or green lacquer. It contains a pancake turner, mixing spoon, serving spoon, spatula, fork, utility knife, parer and slicer.

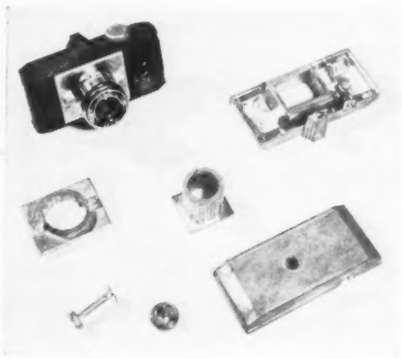
■Originally designed for storage of permanent and semi-active records of banks, steel storage files, a product of Steel Storage File Co., 2216 West Sixty-third street, Cleveland, are finding application in general offices and are being used also for storage of tools, supplies and small parts.

Files are tailor-made to fit any printed form or material to be stored, and are welded of substantial weight steel. By means of a locking device drawers or files of any size may be stacked to any convenient height. Files combine functional features of front-office files and are painted the customary green.

■ A full revolving ⅜-yard machine, named the Comet, available in any combination as shovel, crane, clamshell, dragline, pile-driver or trench-hoe, has been introduced by Hanson Excavator Works, 222 South Michigan avenue, Chicago.

Machine is mounted on an electrically welded steel lower base or frame of rigid construction. Crawler frames are heavily webbed, and crawlers are oversize to provide ease of travel and operation. Upper turret frame carries machinery on a ring gear, revolving on rollers. All clutches are of the expansion double-shoe type with independent hydraulic control. It is possible to crowd, hoist, swing, propel and raise the boom simultaneously. This shovel is the smallest of the Hanson group, weighing 20,000 pounds.

■ A candid camera, formed almost entirely of zinc alloy die castings, has just been introduced to the low-price market by Universal Camera Corp. Many features formerly found only in more expensive models are

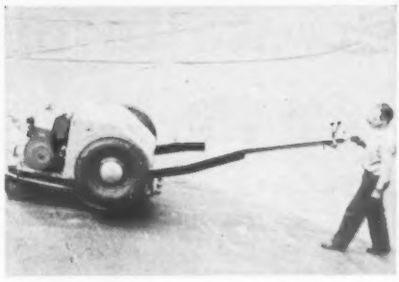


included in this camera, it is claimed. The lens is an f:7.9 Vitar; the shutter has three speeds, 1/25-second, time and bulb, and an iris diaphragm with four stops, f:7.9, 11, 16 and 22.

Practically every part of this Univex Iris camera except its lens and shutter is die cast of zinc alloy. It is finished in a combination of baked enamel and satin chromium plate. Careful elimination of unnecessary metal has brought combined weight of die-cast parts to exactly 1 pound.

■ Featuring portability as its chief advantage, a street roller for jobs varying in size from pot holes to city blocks has been introduced by Littleford Bros., Cincinnati.

Machine can be moved to and from job by attaching to a truck in the same manner that a trailer is towed. It consists of two rollers—a large roller giving 150 pounds per inch compaction and an auxiliary front roller. Instead of the conventional casting, smaller front roller is welded from 10¾-inch pipe, 2 feet in



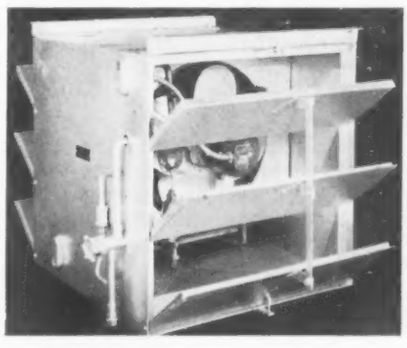
length, with a steel disk welded into each end. Machine operates at an average speed of 2 miles per hour and is used on hot or cold bituminous mix, earth subgrades or brick surfaces, where area is too small to warrant use of a large roller.

■ For spotting loaded railroad cars when a switch engine is not available, capstan type car pullers of 7½ to 15-horsepower rating, manufactured by Fridy Hoist & Machinery Co., Mountville, Pa., are particularly useful in that a single man can do work which formerly required a yard gang of four or five men.

These machines are often subject to overloads. To assure maximum ruggedness and strength in the vertical capstan, which must withstand a pull of as much as 500 tons, an alloy iron containing 1.25 to 1.50 per cent nickel and about 0.30 per cent chromium, produced with 30 per cent steel in the mixture, is employed. Same nickel content, without chromium, is specified for the spur gears.

■Designed to eliminate principal difficulties encountered in the refrigeration industry in defrosting low side in freezer rooms, a new unit, known as the Freezing Oven, has been introduced by Trenton Auto Radiator Works, Trenton, N. J.

This low temperature unit cooler is housed in an insulated steel shell with rear adjustable louvers. It has a self-contained electrical defrost scheme. By shutting suction hand valve, closing louvers and turning on heater, unit becomes an insulated electrical oven. Whole defrost process is accomplished in 20 to 30 minutes without materially affecting temperature of cooler.



Grease Institute Surveys Service of Its Products

■ PROPER selection and use of greases, specifications for greases, and devices for supplying grease to industrial machinery, were subjects given full discussion at the sixth annual convention of the National Lubricating Grease institute in Chicago, Oct. 3-4. Sessions conducted at the Stevens hotel were well attended. Officers for the coming year were elected, the new president being M. R. Bower, Standard Oil Co. of Ohio, Cleveland. Announcement of the election appeared in STEEL for Oct. 10, page 224.

Selection of grease as to consistency depends obviously on bearing design and service, it was stated in one paper. In dealing with chemical and physical evaluation of lubricating greases, the authors, W. A. Lutz and H. A. Ambrose, Gulf Research & Development Co., and W. A. Gruse, Mellon Institute of Industrial Research, Pittsburgh, pointed out that in many light, high speed installations, where frictional loss is not desirable, a relatively solid product which channels in place is useful.

In a ball bearing, for example, a channeling grease will form a ring adhering to and rotating with the ball retainer. Since there is essentially no internal shearing or working of the grease, the bulk of the friction is the relatively small amount developed in the thin film on the balls and race. In comparison, semifluid greases will flow readily against the moving parts, to be churned and worked during the operation. Such a lubricant may be necessary to carry the imposed load, but internal friction will be high.

Starting Torque Important

The starting torque of the grease-lubricated bearing is of some importance, it was stated, particularly in cold climates or in the apparatus where a high starting torque will cause disturbances in the system. For example, if a textile spindle bearing were lubricated with a grease having a high starting torque, belt slippage might occur, causing breaking of the textile threads.

It was pointed out that the starting torque of grease appears to be dependent upon the freezing point of the oil from which it is made, moderate variations in soap content having little influence at low temperatures. Greases to be used in bearing at low temperature apparently should be low in water content to avoid freezing and formation of ice crystals which would increase internal friction. The running torque of a grease may be important where a large number of units is connected into one system, since power consumption will be affected. A channeling grease would offer advantages in such a case, it was stated.

While the melting point determines the highest temperature at which a grease may safely be used, the authors point out that the relation should not be taken too literally. A lime soap grease may melt at about 200 degrees Fahr. but it will not, in general, function properly above 160 to 180 degrees Fahr. because water essential to its structure will be lost at any higher temperature. While this consideration does not apply with the same force to mixed base and soda soap greases, it is pointed out that experience is still the best guide in relating melting point to possible service.

Usefulness of a grease may be limited not only by its consistency and melting point but also by its mechanical and chemical stability. It is not unusual, according to the authors, to expect almost continuous operation of a greased bearing for several months without renewal of lubricant and at temperatures as high as 265 degrees Fahr. It is obvious that a high stability is required to meet these severe requirements.

An improvement in the specification of greases could be made if the purchaser would realize that high speeds and heavy duty have put competitive buying of cheap lubricants into the class of short-sighted procedures, it was pointed out. Often it is true that lubricating cost is about 0.5 per cent of total operating costs, while the price of deterioration and shut-down is extremely high. The best lubricant will be the cheapest, and complete frankness as to operating conditions will help to find this best lubricant. In the final analysis, it was stated that specifications must govern functional properties; otherwise they become a source of trouble for all concerned.

M. J. Helmes, sales manager, lubricator division, United American Bosch Corp., Springfield, Mass., presented a paper discussing grease application equipment in the industrial field.

"We all know that successful grease lubrication is dependent on many factors," Mr. Helmes began, "but above all, improper application of the lubricant is bound to have disastrous results which can never be offset by the lubricant itself, regardless of the extent to which you improve its quality. It is well-nigh impossible to attain the ideal in lubrication, since the mechanical condition of machinery is never constant and many factors, difficult to control, enter into the problem. Yet, today, it is possible to come close to attaining this ideal."

Mr. Helmes pointed out that there are a great variety of grease cups. While those with a spring-actuated plunger, for instance, are built toward giving a constant rate of flow, they really do not fulfill this purpose. The reason is that the spring is fully compressed when the cup is full and the pressure upon the grease is therefore much greater than when the cup is nearly empty. This change in pressure produces a great difference in flow which, of course, is undesirable.

Feed Is Not Uniform

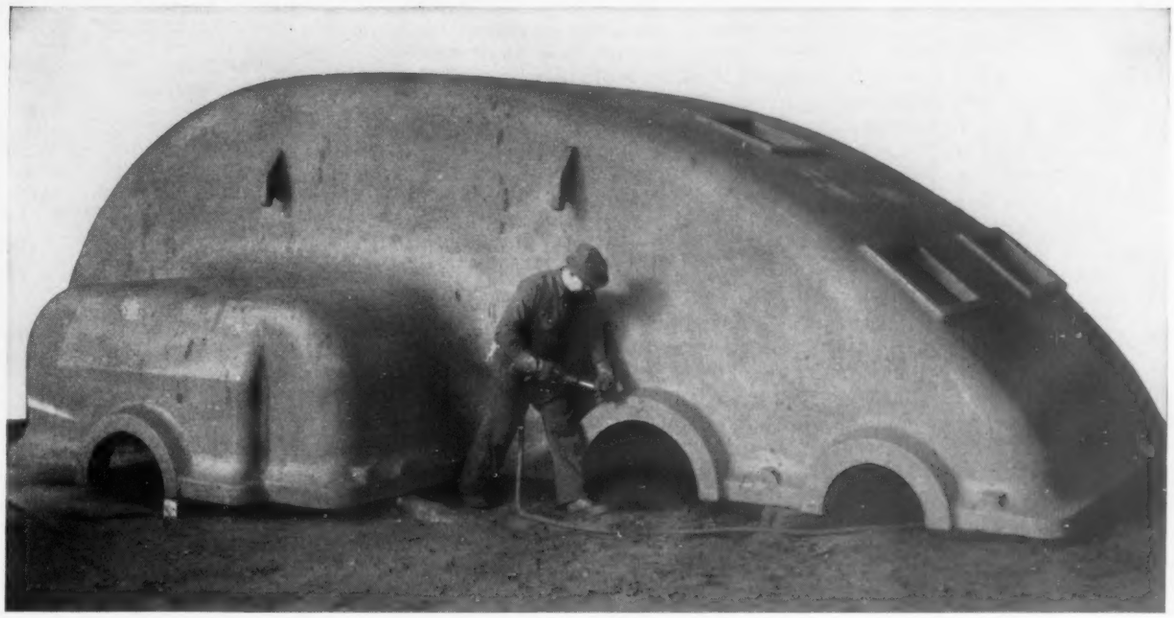
Air compression grease cups also fall short in providing uniform feed for the same reason. The low initial cost of these inefficient devices alone seems to account for the vast number of them still to be found in many industrial plants, in Mr. Helmes' opinion.

He stated it is true that pressure guns offer some possibilities for the lubrication of industrial machinery equipment. With frequent application they may be used on secondary, unimportant bearings to a certain degree of satisfaction although even here they do not fulfill the requirements of efficient lubrication. However, deterioration of the grease film is always taking place when pressure guns are used because lubrication is intermittent. The lubricating efficiency of the film is constantly diminishing until each succeeding pressure gun application is made.

There is always grave danger that the bearing will go dry, regardless of the thoroughness of the attendant to whom lubrication is entrusted, and no matter how closely he is checked, it is practically impossible to eliminate the human element, it was stated. Usually, his oversight can be discovered only by disastrous results, when it is too late.

Accordingly, Mr. Helmes pointed out that the modern efficient method of applying grease to a bearing is to do it automatically by a forced feed and a consistent rate of flow. This harmonizes with the best practice in oil lubrication and is the underlying principle in the development of centralized grease lubrication equipment.

From the outset, certain limitations in the handling of grease had to be taken into consideration. Like-



CAST IRON GEAR COVER

Complete Equipment

for

The finishing end of Strip Mills
Tin Mills and Sheet Mills
Rolling Mill Machinery
Roll Lathes
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Specialists in Alloy Irons. Our own development in this respect is Paralloy, a mixture of Nickel, Chrome and Molybdenum Alloys properly proportioned to produce consistent results. It will deliver high strength, improve toughness, maximum machinable hardness and ready response to heat treatment. This has a special advantage for forming dies or other castings that require resistance to abrasion.

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SAND AND CHILLED ROLLS

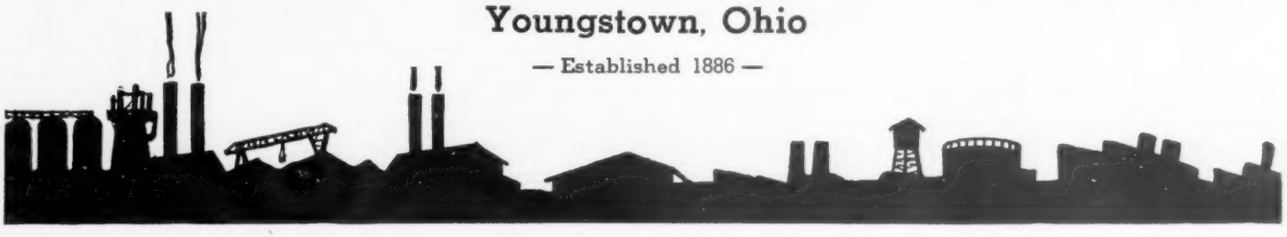
YOUNGSTOWN SPECIAL ALLOY ROLLS

CASTINGS UP TO 100,000 LBS.

The Youngstown Foundry & Machine Company

Youngstown, Ohio

— Established 1886 —



wise, it was recognized that to maintain a perfect grease film in the bearings, individual feed lines were necessary through which the required amount of grease could be fed, and fed against the resistance pressure in the bearing and against the friction of the feed line.

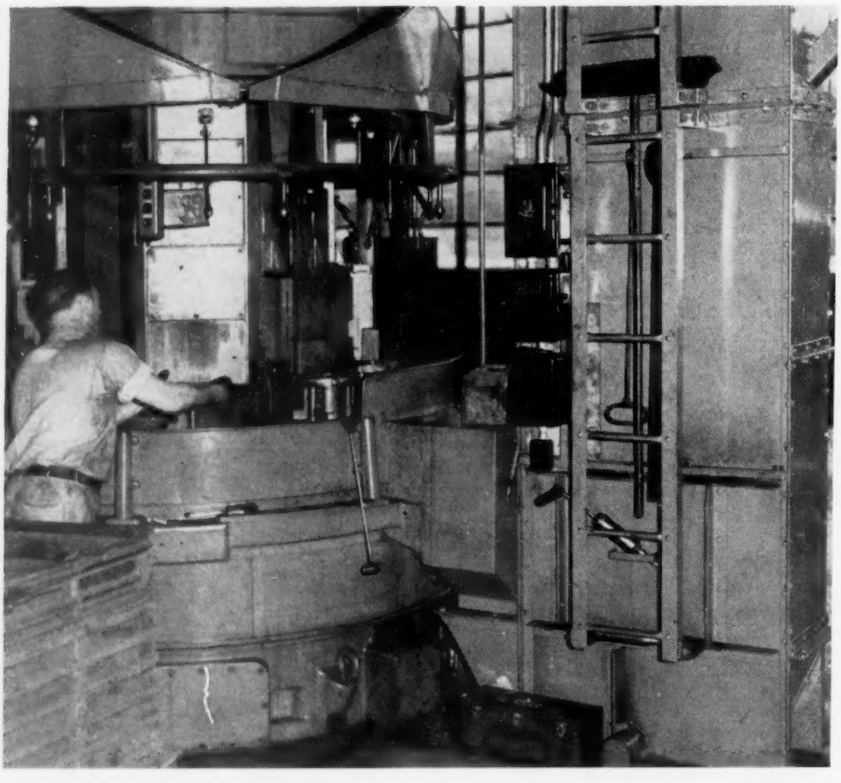
The individual lubricating requirements of various bearings was another important factor, it was pointed out. In the development of a forced-feed grease lubricator that would be suitable for roll neck lubrication of pinion and mill stands in the steel plants, particular consideration was given to the design and construction of the pumping mechanism required to meet the tremendously heavy lubricating requirements involved. For each lubricating point of these important bearings, its individual pump unit was provided in the lubricator and each unit delivers the grease in a positive manner against the existing resistance pressure in the respective bearings and the frictional resistance of its feed line.

Mr. Helmes explained that regulation of the grease flow to the lubrication point is attained by simply adjusting the stroke of the individual pump unit to any length of stroke from "full" to "no delivery." A minute control of the grease flow is thus made possible and a constant grease film is maintained in all bearings regardless of these varying requirements. This is extremely important, he said, because even though bearings are similar the roll neck bearings of one roll, for instance, show variations in the resistance pressures.

Among the series of automatic positive forced-feed grease lubricators are apparatus for lighter duty, such as in rubber plants, cement mills, sugar mills, chemical plants and coal preparation plants. Also available are light-duty forced-feed grease lubricators for medium-sized machinery equipment.

The economic value of these apparatus is recognized by those who are using them and their application in the industrial field is increasing steadily, it was stated. They are compact, of simple construction, efficient, and can be installed by the user on any of his equipment.

Cast Iron Shavings No Problem Here



■ **This huge automatic is used in machining cast iron automobile clutchparts at Inland Mfg. Co. division of General Motors Corp., Dayton, Ohio. With an unusually large amount of shavings and borings to be disposed of ordinary methods would involve much floor space, trucking and considerable work. However, lift elevator at right takes scrap material from machine, dumps it on belt conveyor. From conveyor material falls into hoppers discharging into buckets which carry it to bins—all automatically**

Price Policy Effect On Economic Progress

Industrial Price Policies and Economic Progress, by Edwin G. Nourse and Horace B. Drury; cloth, 314 pages, 5¼ x 8 inches; published by the Brookings Institute, Washington; supplied by STEEL, Cleveland, for $2.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W. 1.

Institute of economics of the Brookings Institute undertook this study to afford constructive aid to economic progress, looking toward an inductive development of a positive theory of the pricing process. The authors believe this is more practically useful than destructive criticisms of the current price mechanism on the ground that they depart widely from principles of competitive prices developed out of the conditions of simpler economics.

The study is not directly concerned with the present depression or with depression causes or cures. Whatever its immediate application, its analysis of price policies is concerned with economic hygiene rather than emergency treatment of acute illness.

On the basis of a comprehensive view of actual complexities in which the business man works, it seeks to discern the constructive implications of what is already being done by pacemakers in this field and to envision the results to be expected if these constructive lines of business practice were widely followed.

The study naturally falls into three parts: First, general statistical matter as a bird's eye view; second, analysis of particular concrete aspects of recent industrial price-making; third, organizational factor and various ways in which the specialized executive function may be exercised through price policy to determine course of modern industry.

Outline Methods for Guarding Employe Health

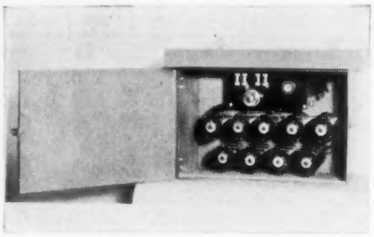
■ Two new bulletins outlining measures for combating industrial disease and for protecting employe health are being distributed by Air Hygiene foundation, 4400 Fifth avenue, Pittsburgh.

One deals with "Determination of Lead," a metal which alone or in combination constitutes a triple threat to health of workmen exposed, as it and its compounds can be inhaled, swallowed or absorbed through the skin. The other bulletin, "Identification of Industrial Dusts," is a guide for appraising dust risks.

These bulletins are part of a series prepared by the Preventive Engineering committee of Air Hygiene foundation, of which Prof. Philip Drinker of Harvard is chairman.

Rectifier Protects Underground Pipe Lines

■ Westinghouse Electric & Mfg. Co., Pittsburgh, has announced a copper-oxide rectox rectifier for cathodic protection of underground



pipe lines by counteracting galvanic action and electrolysis.

Rectifier has a range of 3 to 50 volts, 1 to 125 amperes direct current output. It consists of necessary rectox unit for desired rating, together with a two-winding transformer, disconnect switch and terminal board, all mounted on sheet steel ventilated cabinet, which can be designed for either indoor or outdoor use.

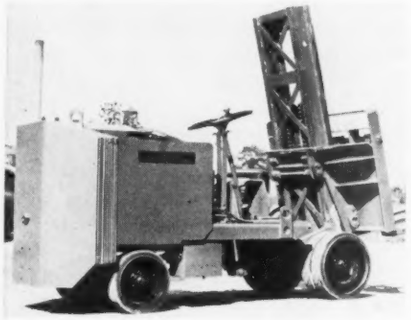
Amount of current and voltage needed to protect a given length of pipe line can be determined only by actual trial, due to variation in resistivity of coating and of soil condition.

Rectifier has no rotating parts and operates entirely without noise.

Fork Truck Designed To Handle Heavy Loads

■ Towmoter Co., 1226 East 152nd street, Cleveland, has announced a special fork truck of extra heavy design, with carriage and fork arrangement built to handle bulky and unwieldy loads.

Originally designed for handling heavy bales of wet pulp, this truck has been found equally suitable for



moving bulky loads of steel tubing, lumber and crated merchandise. It is available with a detachable and interchangeable scoop.

Other features, such as straight gasoline power, hydraulic lift and tilt, high speed forward and reverse and driving wheels under load, are same as on standard model lift trucks.

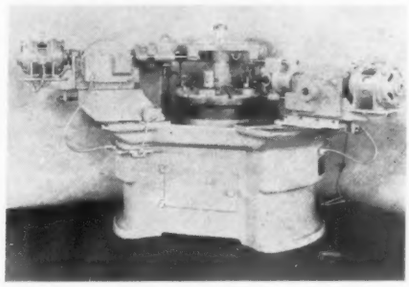
Special Alloy Steel Used for Rail Punches

■ Tallman Mfg. Co., Shelbyville, Ill., has introduced two new Talloy lightweight rail punches for making ½-inch to ⅞-inch holes through rails for attaching splice bars or installing rail bonds.

Made of high strength alloy steel and scientifically heat treated, punches are light in weight in proportion to their capacity and are easily carried, handled and operated by one man. Carrying handle is fully enclosed and forms a part of the main frame. All wearing parts are special analysis alloy steel and are easily replaceable. Punches are available in two different styles and sizes for 12 to 40-pound and 12 to 60-pound rail.

Mills Expansion Slots In Aluminum Pistons

■ Langelier Mfg. Co., Providence, R. I., has developed a machine for milling expansion slots in aluminum



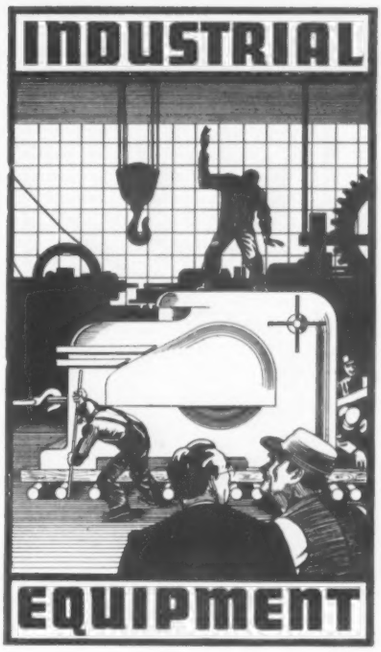
alloy pistons for General Motors Truck & Coach division of General Motors Corp.

Four standard automatic, positive-feed units are mounted on a circular base. Three heads are equipped with auxiliary milling attachments, and a fourth unit is used for drilling a clearance hole for the cutter runout. Pistons are clamped with a locating pin through the wrist-pin hole and are indexed through various working stations. Indexing unit is controlled and interlocked electrically with work heads. Base contains a lubricant tank and a motor-driven pump delivers coolant to cutting tools.

Production is said to average 375 pieces per hour.

Fan Is Cast Aluminum

■ Advance Aluminum Castings Corp., 2742 West Thirty-sixth place, Chicago, has developed a new type



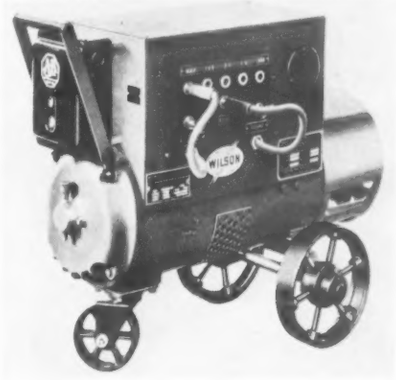
blower fan with hub cast to form the driven unit of a flexible coupling.

Marketed as Castalu, this fan is designed for service on oil burners, stokers, and air-conditioning equipment. It is cast in one piece of light, non-corrosive aluminum. Standard sizes from 3 x 1½-inch to 10½ x 5¼-inch are available in either clockwise or counter-clockwise rotation.

Arc Welding Manual For Practical Worker

■ Wilson Welder & Metals Co., 60 East Forty-second street, New York, has added to its line a single-operator, 100-ampere motor generator arc welder, designated as model SC.

Machine is unusually compact and is designed primarily for light-gage work, operating efficiently on the thinnest material that can be arc welded. Adjustment of the gen-



erator's output is accomplished by five marked receptacles with plugs for current or heat control and a

multi-point field rheostat for adjustment of open-circuit voltage. Generator is of special design and will provide unvarying welding heat. It is of two-bearing construction, operating at 1800 revolutions per minute. Rheostat is equipped with a dial and pointer so that machine can be reset for any previously used current value.

Control Minimizes False Operation

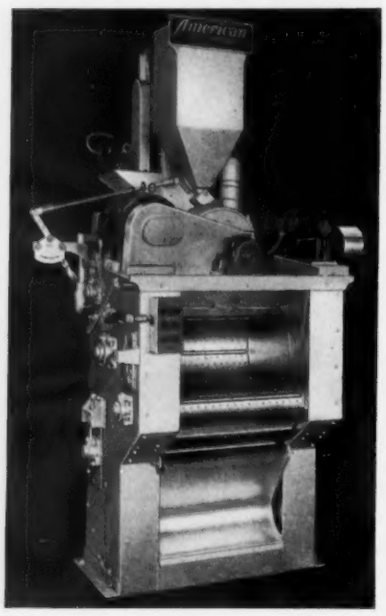
■ General Electric Co., Schenectady, N. Y., has developed a control system for punch-presses, actuated by air clutches and intended to minimize possibility of false operation.

Consisting of a magnetic control panel, a rotating cam type limit switch and oil-proof pushbutton stations, this equipment permits four different operations. A selector switch, which can be locked in position, modifies circuit so that any of following operations may be obtained: "continuous stroke"; "short," which allows one complete stroke; "long," which allows operator to "inch" press down to a certain point at which solenoid remains energized and press completes stroke automatically; and "inching."

All pushbuttons, limit switch contacts and contactor coils are connected in secondary circuit of a specially designed control transformer, making it impossible for a ground at any point in the system to energize solenoid falsely.

Abrasive Blasting Unit Cleans Small Castings

■ American Foundry Equipment Co., Mishawaka, Ind., has placed on the market a small, airless abrasive blasting unit, designed to clean a limited number of small castings, forgings, heat-treated parts, springs and stampings.



Unit has a bladed wheel which turns at 2250 revolutions per minute. Abrasive is fed into bladed sections of this wheel through a control gate at its center, and centrifugal force hurls abrasive upon the work. Volume and direction of abrasive are controlled so that any type of finish is obtainable with proper adjustments.

A rubber conveyor is used to tumble the work instead of the usual metal conveyor, giving a gentle action in which pieces cascade one over another. Travel of conveyor is adjustable through a speed reducer, permitting control of time work is exposed to blast.

Machine has an operating capacity of 2 cubic feet and is known as the 20 x 27-inch model. A total of 6 horsepower is required to operate the unit.

Self-Dumping Trailer Handles Bulk Materials

■ Easton Car & Construction Co., Easton, Pa., has placed on the market a 3-cubic yard trailer of automatic dump design that permits body to roll over and discharge its load when driver releases a latch. When empty it returns automatically to loading positon.

This type of trailer, known as model AR-3 Rapidump, can be used for handling refuse, bulk materials and production parts. It will handle considerably more than 3 cubic yards when heaped with door in position, but is rated at this capacity because it may be used with door off. Trailer is 7 feet 6 inches wide overall and is 6 feet 6 inches long inside body. It weighs 1900 pounds. Frame and body are sturdily constructed of welded steel plate. Running gear is equipped with pneumatic tires, and Timken bearings are used in hubs of pressed steel wheel centers.

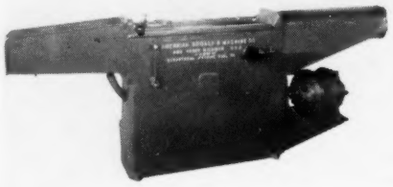
Improves Bucket Design

■ Blaw-Knox Co., Pittsburgh, has introduced recently developments in the design of its light-weight alloy steel grab buckets intended to permit application of modern rope-reeved grab buckets to high-speed tower operation in ship unloading.

Improvement involves use of guide rollers located at a much lower elevation than usual, thus allowing for a free play of about 70 degrees for the closing line. Two guide rollers are used instead of one in order to split the angle of impingement in the event closing line should pass through an arc or more than 70 degrees in relation to the bucket.

Pumping Unit Added To Broaching Machine

■ American Broach & Machine Co., Ann Arbor, Mich., has introduced a horizontal hydraulic pull-type machine, No. H-2-30, for light internal broaching operations, such as keyways and splines.



Machine can be changed easily from one operation to another by changing work bushings, broach pullers and broaches. Surface broaching operations can be done in rapid and satisfactory manner by adding suitable fixtures and tooling. Bed is well-ribbed to support machine members and guide ways for the draw head. This bed contains hydraulic reservoir with Sundstrand pumping unit submerged, and coolant tank and chip receptacle in a separate compartment.

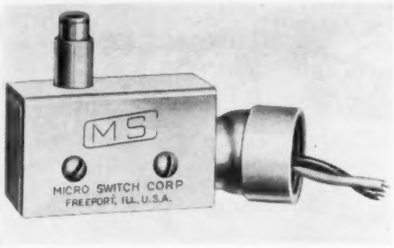
Draw head is long and has a lubricating oil reservoir in its body. Positive lubrication to guide bars and slide ways provides long life and accurate alignment. Cycle is fast, as dual cylinders are used with ram connections to the draw head, affording a steady, balanced pull on the cutting stroke.

Switch Housed in Metal

■ Micro Switch Corp., Freeport, Ill., has added to its line a Metal-Clad micro switch with an overtravel of ¼-inch.

Known as series Q, this switch has a 5/16-inch diameter actuating plunger, which can be moved ¼-inch beyond operating point without straining snap action mechanism. A pretravel of 0.015-inch with an operating pressure of 7 to 8½ ounces and a movement differential of 0.0002 to 0.0003-inch are required

to operate the switch. Switch is sealed in a metal housing with right or left-hand angle conduit fitting threaded for ½-inch pipe.



Housing is available also with ¾-inch straight fitting.

Contact arrangements can be for normally closed, normally opened or double-throw circuits. Switch is listed for 10 amperes, 125 volts alternating current; 2 amperes, 600 volts alternating current; ½-horsepower motors, 115 to 460 volts alternating current.

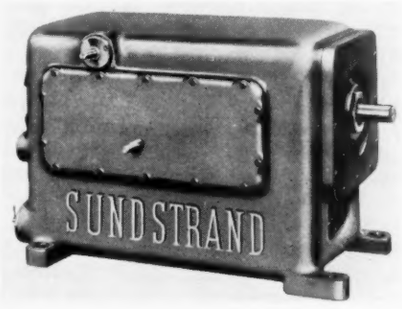
Bronze Mounted Valves Have Renewable Bushings

■ Jenkins Bros., 80 White street, New York, have announced a line of bronze mounted and all-iron U-bolt gate valves, featuring high resistance to springing and distortion.

Valve has a renewable bushing which makes it unnecessary to junk valve bonnet when operating threads are worn. By slipping new bushing into position, thread engagement as good as new is obtained in the old bonnet. Bushing can be lifted out, enabling user to do a thorough cleaning job in upper part of bonnet chamber.

High-Speed Reverse Is Feature of Transmission

■ Sundstrand Machine Tool Co., Rockford, Ill., has announced a new line of oil-power, variable speed



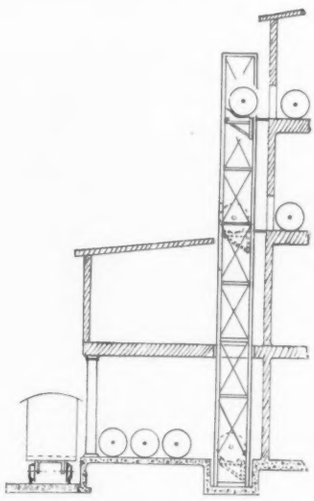
transmissions, said to develop high torque with smooth operation both at low and high speeds and to provide high mechanical efficiency throughout entire range of speed.

Instant reversal is possible at high speeds on continuous duty, greatly increasing range of application. Transmission is housed in a compact case and consists of variable displacement, multiple-piston type pump, a fluid motor, which may be either variable or constant displacement, and a single control mechanism. Control may be either automatic or manual.

Model illustrated is rated at 5-horsepower and provides speeds from 3 to 2400 revolutions per minute. Unit is available also in 2 and 10-horsepower models.

Elevator Unloads and Routes Big Paper Rolls

■ Revolvator Co., North Bergen, N. J., recently adapted its roll-routing equipment to solve a container company's problem of getting 4000-pound rolls of paper from a rail



siding to the two upper floors of a 4-story building.

Elevator starts inside one building, extends outside another and is 60 feet high. It receives 42 x 60-inch rolls from freight cars, carries them past two floors and delivers them to third or fourth floor, as desired, by a selective system of relays. Cradle is dumped by an independent motor drive, roll rolls off at floor selected and cradle returns to original floor automatically. Same automatic return operation is provided between two upper floors. Roll destination is chosen simply by opening electrically interlocked door at desired level.

This or a similar arrangement can be used not only in paper plants but in other industries where roll products are handled.

Flat Nozzles Introduced

■ Spraying Systems Co., 4922 West Grand avenue, Chicago, has announced a new line of Flatjet spray nozzles, varying in size from ¼ to ¾-inch and in capacity from 1 to 20 gallons per minute.

Nozzle delivers a flat spray with uniform distribution, suitable for industrial washing, chemical processes, scale washing, cooling or wherever a sharp, flat, hard-hitting spray is required. Standard nozzle is brass, although other metals can be specified.

Uses Duplex Circuit to Transfer Electric Load

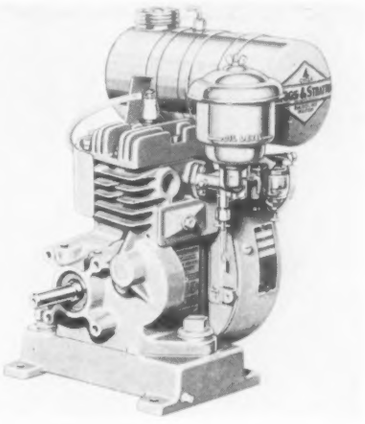
■ Delta-Star Electric Co., 2400 block, Fulton street, Chicago, has devised a type of switch control euipment with which automatic load transfer can be made through motor-operated air break switches by means of two independent circuits—one preferred, the other emergency.

Switches are normally closed on preferred line, normally open on emergency. With voltage loss on preferred line, air break switch opens after a time delay, then closes on emergency line. Restored voltage on preferred line closes switch after a time delay, then opens emergency. An adjustable time delay feature prevents load transfer on transient voltage dips. Operation is automatic, but with provision for manual substitution. When set for manual control each motor mechanism can be independently operated, opening or closing either air break switch as desired.

Industrial Gas Engine Has Improved Magneto

■ Briggs & Stratton Corp., Milwaukee, has announced a single-cylinder, 4-cycle, air-cooled gasoline engine, model IBP, which develops 1 horsepower at 3000 revolutions per minute.

Piston displacement is 4.71 cubic inches with a 2 x 1½-inch bore and stroke. Ignition is supplied by a dust and moisture-proof high tension flywheel magneto. Other standard equipment includes Silchrome



exhaust valve with alloy steel inserted seat, molybdenum alloy valve guides, aluminum alloy cylinder head, adjustable pneumatic governor, drop-forged crankshaft with ball bearing and oil seal, float-feed carburetor and oil-bath air cleaner.

Turret Lathe Attachment Turns Locomotive Bolts

■ Gisholt Machine Co., Madison, Wis., has introduced a taper bolt turner for use with its high production turret lathes, providing a new method for handling the machining of taper bolts in locomotive construction shops or repair shops.

Turner may be set up quickly for machining taper bolts of different sizes, and also turns straight diameters, which permits bolts to be finished completely in one setting. Bolts 2 inches in diameter and 12 inches long are machined completely in 1½ minutes.

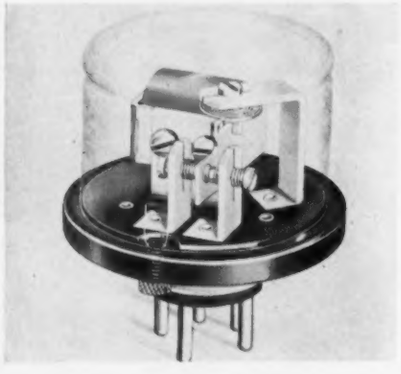
This taper bolt turner is set up merely by changing back plate of a lathe for mounting on the turret face. A guide bar with tapered guide cam, which actuates rollers and cutter, is fastened to headstock and slides in the angle way on the turner. Guide bar is arranged so that it can be swung out of the way when not in use. In operation, as carriage feeds forward, cam depresses the roller follower which rotates a quill inside the turner moving tool slide and roller slides outward at a uniform rate. Rollers follow immediately behind the tool, rolling on finished taper surface.

Standard turner will cut a taper having a maximum diameter of 2½ inches and a minimum diameter of ⅝-inch, with a length of about 14 inches. Standard taper furnished is 1/16-inch per foot, but different tapers may be secured.

Relay Applicable to Photo-Electric Systems

■ Sigma Instruments Inc., Belmont, Mass., has developed for electronic and delicate control applications a compact, sturdy relay of rapid, positive action at low power input. Its fine silver contacts, forming a single pole, double-throw switch, handle non-inductive loads up to 150 watts at 110 volts, alternating current.

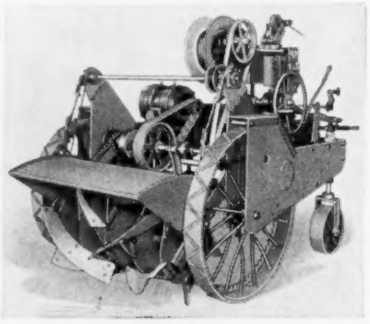
Available in various field resistances, this type 3-A relay requires only 12 milliwatts for its operation. It may be installed directly in a variety of vacuum tube circuits and is especially adaptable to use with photo-electric systems. Relay is housed in a dustproof metal case 2⅜ inches in diameter by 2¼ inches high.



Simplified Sandcutter Built for Foundry Use

■ American Foundry Equipment Co., Mishawaka, Ind., is now building a simplified sandcutter, known as model AM, for the foundry requiring a small unit.

Two motors provide power for all



operations. One operates cutting cylinder and electric cable reel; the other operates ground travel device. Cutting cylinder is elevated and lowered by means of a hand-operated cable hoist. A hand lever is provided for steering. An equalizer gives the frame complete flexibility when maneuvering over uneven floors.

Machine is made in two standard sizes with cutting cylinders 45 and 50 inches long. Maximum clearance over sand is 26 inches. Width overall for each machine is 68½ and 73½ inches respectively and height overall is 81 inches.

Resists Abrasive Action Of Ceramic Materials

■ DeVilbiss Co., Toledo, O., has added to its line a special model of its heavy duty type MBC spray gun, designed and constructed to resist abrasive action of porcelain and ceramic materials.

Embodying all features of the standard gun, this model incorporates strengthened wearing parts and materials which increase its life and assure efficient performance. Body is finished in natural alumilite. Trigger pivot screwhole bushings and reinforcements inserted in trigger at contact point of

needle are special hardened steel. Inserts in orifice of the fluid tips and points of fluid needles are carboloy, a material only slightly less hard than diamond.

Mixes Coolants For Metal Cutting

■ Mixing Equipment Co., Rochester, has announced production of a line of machines for mixing coolants used in metal cutting operations such as turning, milling, boring, grinding and pipe threading.

Emulsions made with soluble oils are generally unstable and require an efficient means of dispersing soluble oil into water and maintaining absolute uniformity of coolant at point of use. These mixers are well adapted to this work, it is claimed.

In a typical installation, two mixers are used, equipped with monel metal shafts and propellers, and explosion proof motors. Tanks hold 600 gallons, and are installed in a separate building. Coolant is pumped in a closed circuit through buildings where metal cutting is done. In operation, tank is filled half full of water, mixer is started and soluble oil is let in from a measuring tank.

Multi-Flame Tips Added

■ The Linde Air Products Co., 205 East Forty-second street, New York, has added to its line two new multiflame welding tips for pipeline construction by the Lindeweld process. Use of these tips is said to result in a 25 per cent increase in speed and a corresponding reduction in gas consumption.

Four-flame tip has been designed for position welds, and six-flame tip is intended primarily for rolling welds. In addition to the main welding flame, the four-flame tip provides two flames for preheating the vee and a fourth flame for preheating the welding rod. Six-flame tip is similar in design with exception that it has two additional vee preheat flames.

ADVERTISING PAGES REMOVED

Foundry Sand System

(*Concluded from Page* 56)

A magnetic pulley on conveyor J removes any scrap metal that may be present. Sand then is dumped into a bucket elevator and is elevated to the large hopper from which the entire process is repeated. This cycle for sand is performed about every two hours.

One of the large problems is cooling the sand. This necessitated the use of wide belts and slow speeds. At one place, a 30-inch belt is used with only a 50-ton capacity required.

Conveyors frames are made from steel channels and have 5½-inch roller bearings spaced on 4½-foot centers. Roller bearing head shafts with gear reducers are used.

The entire system is under the complete control of one man at a central control panel.

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Analysis of Air for Industrial Poisons

■ *Some Methods for the Detection and Estimation of Poisonous Gases and Vapors in the Air,* by A. S. Zhitkova, S. I. Kaplun and J. B. Ficklen; cloth, 198 pages, 6 x 9 inches; published by Service to Industry, West Hartford, Conn.; supplied by STEEL, Cleveland, for $3; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London, S.W.1.

In the analysis of air in industrial factory inspection, the hygienist is not interested in the composition of the air as a whole, but in the noxious materials which enter in the course of industrial production. Since only small quantities of those substances are present, special procedures quite different from those usually employed in gas analysis must be used. In Russia considerable attention has been given to that work, and this volume presents in detail the various methods used by the Soviet state.

The book is divided into 33 chapters, of which the first is devoted to selection of air to be sampled and method of sampling. Chapters II to VI deal with determination of carbon dioxide, carbon monoxide, sulphur dioxide, and hydrogen sulphide. Chapters VII to XV discuss analyses for nitric acid and nitrogen oxides, ammonia, chlorine, hydrogen chloride, hydrogen fluoride, hydrogen cyanide, arsenic and arsine, and metals in general. Chapters XVI to XXIV are concerned with determination of zinc, mercury, lead, organic materials in general, methane, acetylene, formaldehyde, acrolein, and acetone.

Alcohols, phenol, esters, ethyl ether, and benzine are treated in chapters XXV to XXIX and the remaining chapters describe determination of benzene, aniline, nitrobenzene, and turpentine. An appendix deals with technical gas analysis, including the Bunte and Orsat apparatus, standard solutions, acidimetry and iodometry. A bibliography and several tables on toxicity and specific gravity of gases and vapors are included.

Builds Up Tool Points

■ With a base metal of tungsten molybdenum wire, a new electrode announced by Harnischfeger Corp., Milwaukee, is used for making tool steel cutting edges on medium carbon steel or for rebuilding worn tools and dies.

This electrode, known as Smootharc Hartung, has air hardening properties which without treatment possess hardness values in excess of 60 Rockwell C. Although not intended as a substitute for cemented carbide tool inserts, electrode is recommended for building up tool points of high hardness. In this procedure it is used with work negative and electrode positive, according to instructions.

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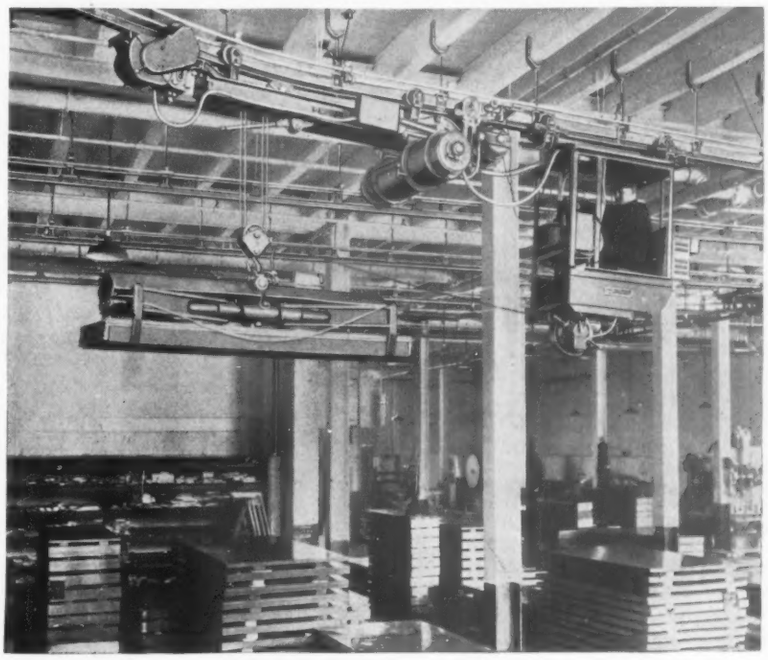

• A low headroom carrier with power to climb grades and a motor operated grab are features of this sheet steel handling installation. Some results have been reduction in aisle space, higher piles, more tonnage per square foot of floor area and one man control of storage operations.

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Synthetic Rubber Depends on Steel

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storage tanks mentioned above. When wanted, it is released with ethylene-dichloride to the reactor tanks, shown in accompanying illustrations, where a closely controlled interaction produces synthetic rubber latex, a white watery liquid containing about 80 per cent water and 20 per cent synthetic rubber in suspension.

Subsequent washing removes useless ingredients and the nearly pure Thiokol then is passed into coagulating tanks shown in Fig. 4. Here an acid catalyst is introduced to bring about coagulation. This is carefully controlled to insure proper rate and proper size particles.

The coagulated latex now is discharged into a filter box shown in Fig. 5, where it is washed and excess water drained off. After this the washed latex is fed into squeeze rolls at the wet end of a continuous drier shown in the immediate foreground of Fig. 5. It comes from the opposite end of this unit in form of particles as shown in Fig. 6. They are then pressed into blocks and shipped to consumers.

Powder Metallurgy Finds New and Important Uses

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which varies according to the coarseness of the grit size, bonding, means of truing and other mechanical factors. A second defect is that produced by the method or the machine used for the grinding and may be in the form of undulations, feed marks, chatters and general surface irregularities.

To remove such defects, Mr. Indge stressed importance of employing a method of refining which does not duplicate the action that produced the original errors. Lapping and honing operations involve principles entirely different from grinding or polishing. Surfaces that are to receive superfine finishes must be properly prepared to make the process of refinement effective. When all the surface "fuzz" left by the grinding and other irregularities has been removed with the surface down to the base metal, it is extremely difficult to remove more material by lapping. Thus, it is important that preparatory work be carefully controlled.

In reviewing the acquirement of such surfaces, Mr. Indge divided the subject under four headings: Lapping, honing, superfine grinding and crankshaft and camshaft finishing, concluding that refinement of ground surfaces made necessary by the demands of industry for improved products must be planned by the designing engineer. Surface finishes are built up, finer abrasives being used for each subsequent operation. Lapping and honing permit production of refined surfaces at high production rates and moderate costs. Fine limits demand fine surfaces and the accuracy of physical dimensions is dependent on refined surfaces.

Carl T. Guething, sales engineer, Heald Machine Co., Worcester, Mass., defining borizing as the precision finishing of surfaces with special machinery, detailed accuracy in borizing. Making the assembly of component parts easier, accuracies attained by borizing have materially reduced tolerances, improving the quality of performance in both efficiency and quietness.

The most common reason for failure to anticipate an expected wear-life of gears arrives from misinterpretation of conditions regarding the nature and magnitude of the load to be carried by the gear, in the opinion of W. P. Schmitter, Falk Corp., Milwaukee. He spoke on gear design as influenced by modern loading practice, taking up the general theory of load transfer in numerous types of gears. It is apparent, according to Mr. Schmitter, that a theoretical equation can only provide accurate evaluation of gear capacity when the assumptions involved are realized. A sub-standard gear may contain manufacturing errors which invalidate any estimates of capacity which may have been prepared. Undue deflections, producing excessive load concentrations usually lead to distress in some form. However, knowledge of the load carrying ability of gears of given specification is today far more complete and accurate than available methods for quantitative appraisal of widely varying load and duty characteristics.

Control of small plant purchases was the subject of W. C. Zinck, purchasing manager, North & Judd Mfg. Co., New Britain, Conn. Function of the purchasing department covers a broader field than the mere procurement of materials, supplies, tools and services for the business, according to Mr. Zinck. Purchases must be made at a cost consistent with economic conditions surrounding the material purchased and safeguarding the standard of quality and continuity of service. Furthermore, purchases must be controlled because sales at a profit in a competitive field cannot be made unless materials being used in manufacture are bought at a cost as low as that enjoyed by competitors and because investment in inventory must be kept at a minimum in these times.

This control of purchases in a small plant, says Mr. Zinck, may be secured by making an analysis by weeks and months of the procurement and disbursement averages for the past three years. Based on these figures, the purchasing manager asks three or more suppliers to submit bids for all the materials to be supplied as needed. It is felt that the penalty exacted for buying in small quantities is negligible in a small plant. If possible, a supplier should be small because his relations with the small plant are more flexible and the quantity of business more desirable than would be the case with a large supplier. Close co-operation between supplier and purchasing department will permit mutual development of a satisfactory schedule of supply. The only objection to this plan is that some suppliers will balk at supplying free warehouse service for the small plant, but this matter is conveniently forgotten when and if the supplier obtains the order.

Trends Show Increased Use of Gas by Industry

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said, is confined usually to the insulating of walls and arches but in many cases it pays to remove old dense refractory arches and replace them with insulating fire brick to reduce heating and cooling time, as well as to save fuel.

A symposium was presented on successful methods for promoting sale of standardized industrial gas equipment. Elmer C. Cook, American Furnace Co., Elizabeth, N. J., discussed heat treating furnaces. R. Louis Towne, Surface Combustion Corp., Toledo, O., presented his views on selling standard equipment.

Spotwelding Aircraft

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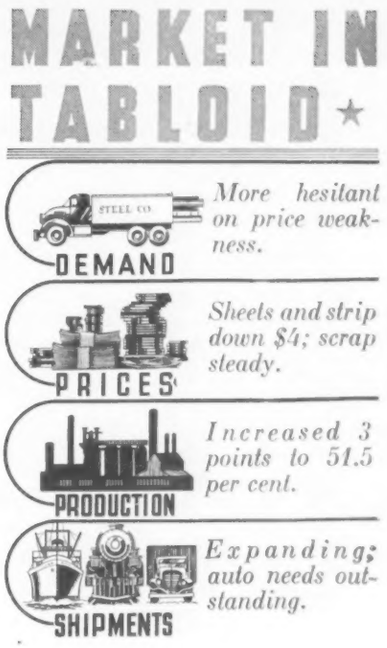
Shear strengths increase in a direct ratio with increase of sheet thickness. The Army Air Corps has specified a design value equal to two-thirds the required minimum shearing strength of the single spot test specimens as listed in Table I. In a joint made from sheets of unequal thickness, the shearing strength is governed by the thinner sheet.

Spacing of spotwelds in many cases is similar to that of riveted construction or slightly less. A typical spacing for non-structural parts is 1 inch. Another factor for consideration is the loss of current due to shunting through spots already welded. Therefore spacing of spotwelds in aluminum alloys, where the effect is greatest, is usually held no closer than ½-inch.

Outlook Favorable Despite Price Drop

Production Rises To New Peak; Buyers More Cautious



■ FAVORABLE factors still predominate steel markets, despite price weakness which has been reflected in some hesitation in buying.

Headed by the automotive industry, the tendency in finished steel consumption remains upward slightly and was translated last week into a 3-point rise in the national steelmaking rate to 51.5 per cent, a new peak for the year to date.

Prospects for steady or heavier steel requirements of leading users the next 60 days are regarded as bright. Automobile builders are cheered by relatively brisk retail demand for new models, and in some instances are reported to have revised upward contemplated assemblies for November.

Motorcar production spurted again last week, touching the best level since the second week of May. Output was 50,540 units, against 37,665 the week before. General Motors assembled 27,525, compared with 17,330 the previous week; Chrysler was practically unchanged at 11,000; Ford increased to 4075 from 2115; while all others turned out 7940, against 7320.

While the open break in steel prices has been confined largely to sheets and strip, reported weakness in some other products has induced consumers to be more cautious in their purchases until the situation clarifies. Since inventories of users generally are moderate, however, no prolonged lapse in buying is anticipated.

Automotive Sheets Off $9 A Ton Since Last May

Latest reductions in sheet and strip prices mean that the automotive buyer at Detroit now is able to buy flat-rolled steel for at least $9 a ton below the market last May. Compared with 1929, most automotive sheets today are estimated to be selling at a reduction of about 40 per cent, while since 1923 the price has been cut more than in half.

While the country's huge capacity for rolling sheets and strip, created through the building of numerous continuous mills in recent years, to a large extent is responsible for price weakness in times of light operations, the increase in producing facilities has done little more than match the growth in consumption of flat rolled steel. Sheet and strip mills today represent slightly more than 30 per cent of all finishing mill capacity, while sheet and strip production in 1937 was 30 per cent of the total output of all finished products.

Most steelmaking districts reported gains in operations last week. Pittsburgh was up 3 points to 40 per cent, Chicago up 1 to 45.5 per cent, Cleveland up 5 to 56 per cent, Detroit up 5 to 77 per cent, New England up 5 to 70 per cent, Cincinnati up 27 to 70 per cent and St. Louis up 3 to 48.5 per cent. Youngstown slipped 4 points to 51 per cent, Buffalo was down 4.5 to 46.5 per cent and eastern Pennsylvania dropped 1 to 32 per cent. Birmingham and Wheeling were unchanged at 57 and 54 per cent, respectively.

Railroad Inquiries Include 30 Locomotives, 2400 Freight Cars

Fair activity continues in building and engineering construction, as indicated by structural shape and reinforcing bar orders and inquiries. Among the larger of new projects for which PWA funds have been approved is Chicago's $39,000,000 subway. Railroad purchases of steel and equipment, while expanding slowly, still are far below normal. Outstanding in pending railroad buying are 2400 freight cars for the Southern and a maximum of 30 locomotives for the Union Pacific. Operations of farm equipment builders are moderately heavier.

Scrap prices are steady in the face of rising steel production, and the composite is unchanged at the preceding week's higher level of $14.04. Reductions in sheets and strip prices cut the finished steel composite 80 cents to $56.40, lowest since the last week of February, 1937. Weakness in flat rolled steel also caused a drop of 48 cents in the iron and steel composite to $36.13.

COMPOSITE MARKET AVERAGES

	Oct. 15	Oct. 8	Oct. 1	One Month Ago Sept., 1938	Three Months Ago July, 1938	One Year Ago Oct., 1937	Five Years Ago Oct., 1933
Iron and Steel	$36.13	$36.61	$36.58	$36.48	$36.32	$39.59	$30.53
Finished Steel	56.40	57.20	57.20	57.20	57.20	61.70	49.20
Steelworks Scrap..	14.04	14.04	13.88	14.23	13.06	15.93	10.37

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Oct. 15, 1938	Sept. 1938	July 1938	Oct. 1937
Steel bars, Pittsburgh	2.25c	2.25c	2.25c	2.45c
Steel bars, Chicago	2.25	2.25	2.25	2.50
Steel bars, Philadelphia	2.57	2.57	2.57	2.74
Iron bars, Terre Haute, Ind.	2.15	2.15	2.15	2.35
Shapes, Pittsburgh	2.10	2.10	2.10	2.25
Shapes, Philadelphia	2.215	2.215	2.215	2.455
Shapes, Chicago	2.10	2.10	2.10	2.30
Plates, Pittsburgh	2.10	2.10	2.10	2.25
Plates, Philadelphia	2.15	2.15	2.15	2.435
Plates, Chicago	2.10	2.10	2.10	2.30
Sheets, hot-rolled, Pittsburgh	1.95	2.15	2.15	2.40
Sheets, cold-rolled, Pittsburgh	3.00	3.20	3.20	3.55
Sheets, No. 24, galv., Pittsburgh	3.50	3.50	3.50	3.80
Sheets, hot-rolled, Gary	1.95	2.15	2.15	2.50
Sheets, cold-rolled, Gary	3.00	3.20	3.20	3.65
Sheets, No. 24, galv., Gary	3.50	3.50	3.50	3.90
Bright bess., basic wire, Pitts.	2.60	2.60	2.60	2.90
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$5.35
Wire nails, Pittsburgh	2.45	2.45	2.45	2.75

Semifinished Material

Sheet bars, open-hearth, Youngs.	$34.00	$34.00	$34.00	$37.00
Sheet bars, open-hearth, Pitts.	34.00	34.00	34.00	37.00
Rerolling billets, Pittsburgh	34.00	34.00	34.00	37.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	43.00	43.00	43.00	47.00

Pig Iron

	Oct. 15, 1938	Sept. 1938	July 1938	Oct. 1937
Bessemer, del. Pittsburgh	$22.34	$21.34	$21.34	$25.26
Basic, Valley	20.50	19.50	19.50	23.50
Basic, eastern, del. Philadelphia	22.34	21.34	21.34	25.26
No. 2 foundry, Pittsburgh	22.21	21.21	21.21	25.21
No. 2 foundry, Chicago	21.00	20.00	20.00	24.00
Southern No. 2, Birmingham	17.38	16.38	16.38	20.38
Southern No. 2, del. Cincinnati	20.89	19.89	19.89	23.69
No. 2X, Del. Phila. (differ. av.)	23.215	22.215	22.215	26.135
Malleable, Valley	21.00	20.00	20.00	24.00
Malleable, Chicago	21.00	20.00	20.00	24.00
Lake Sup., charcoal, del. Chicago	28.34	28.34	28.34	30.04
Gray forge, del. Pittsburgh	21.17	20.17	20.17	24.17
Ferromanganese, del. Pittsburgh	97.77	97.77	97.77	107.29

Scrap

Heavy melting steel, Pittsburgh	$15.00	$15.25	$13.75	$17.15
Heavy melt. steel, No. 2, E. Pa.	12.75	12.75	12.20	14.01
Heavy melting steel, Chicago	12.75	13.60	12.05	13.95
Rails for rolling, Chicago	16.75	17.75	17.05	17.25
Railroad steel specialties, Chicago	15.75	16.60	14.95	19.35

Coke

Connellsville, furnace, ovens	$ 3.75	$3.75	$3.75	$4.40
Connellsville, foundry, ovens	5.00	5.00	5.00	5.25
Chicago, by-product fdry., del.	10.50	10.50	10.80	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Hot Rolled

Pittsburgh	1.95c
Chicago, Gary	1.95c
Cleveland	1.95c
Detroit, del.	2.05c
Buffalo	1.95c
Sparrows Point, Md.	1.95c
New York, del.	2.19c
Philadelphia, del	2.12c
Granite City, Ill.	2.05c
Middletown	1.95c
Youngstown	1.95c
Birmingham	1.95c
Pacific Coast points	2.45c

Cold Rolled

Pittsburgh	3.00c
Chicago, Gary	3.00c
Buffalo	3.00c
Cleveland	3.00c
Detroit, delivered	3.10c
Philadelphia, del.	3.32c
New York, del.	3.34c
Granite City, Ill.	3.10c
Middletown	3.00c
Youngstown	3.00c
Pacific Coast points	3.60c

Galvanized No. 24

Pittsburgh	3.50c
Chicago, Gary	3.50c
Buffalo	3.50c
Sparrows Point, Md.	3.50c
Philadelphia, del.	3.67c
New York, delivered	3.74c
Birmingham	3.50c
Granite City, Ill.	3.60c
Middletown	3.50c
Youngstown	3.50c
Pacific Coast points	4.00c

Tin Mill Black Plate

Pittsburgh	3.15c
Chicago, Gary	3.15c
Granite City, Ill.	3.25c

Long Ternes No. 24 Unassorted

Pittsburgh, Gary	3.75c
Pacific Coast	4.45c

Enameling Sheets

	No. 10	No. 20
Pittsburgh	2.55c	3.15c
Chicago, Gary	2.55c	3.15c
Granite City, Ill.	2.65c	3.25c
Youngstown	2.55c	3.15c
Cleveland	2.55c	3.15c
Middletown	2.55c	3.15c
Pacific Coast	3.15c	3.75c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.10c
New York, del.	2.29c
Philadelphia, del.	2.15c
Boston, delivered	2.42c
Buffalo, delivered	2.33c
Chicago or Gary	2.10c
Cleveland	2.10c
Birmingham	2.10c
Coatesville, base	2.10c
Sparrows Point, base	2.10c
Claymont, del.	2.10c
Youngstown	2.10c
Gulf ports	2.45c
Pacific Coast points	2.60c

Steel Floor Plates

Chicago	3.35c
Gulf ports	3.70c
Pacific Coast ports	3.95c
Pittsburgh	3.35c

Standard Shapes

Pittsburgh	2.10c
Philadelphia, del.	2.21½c
New York, del.	2.27c
Boston, delivered	2.41c
Bethlehem	2.10c
Chicago	2.10c
Cleveland, del.	2.30c
Buffalo	2.10c
Gulf ports	2.45c
Birmingham	2.10c
St. Louis, del.	2.34c
Pacific Coast points	2.70c

Tin and Terne Plate

Tin Plate, Coke (base box)

Pittsburgh, Gary, Chicago	$5.35
Granite City	5.45

Mfg. Terne Plate

Pittsburgh, Gary, Chgo.	4.45c
Granite City	4.35c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.25c
Chicago or Gary	2.25c
Duluth	2.35c
Birmingham	2.25c
Cleveland	2.25c
Buffalo	2.25c
Detroit, delivered	2.35c
Philadelphia, del.	2.57c
Boston, delivered	2.62c
New Cork, del.	2.59c
Gulf ports	2.60c
Pacific Coast points	2.85c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.10c
Chicago or Gary	2.10c
Detroit, delivered	2.20c
Cleveland	2.10c

Buffalo	2.10c
Birmingham	2.10c
Gulf ports	2.45c
Pacific coast points	2.70c

Iron

Terre Haute, Ind.	2.15c
Chicago	2.15c
Philadelphia	2.47c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young., Sparrows Pt.	2.05c
Detroit, delivered	2.15c
Gulf ports	2.40c
Pacific coast ports, f.o.b. car docks	2.50c
Philadelphia, del.	2.22c

Rail steel, straight lengths, quoted by distributors

Pittsburgh, Gary, Chicago, Buffalo, Cleveland, Birmingham	1.90c
Detroit, delivered	2.00c
Gulf ports	2.25c
Pacific Coast	2.35c

Wire Products

Pitts.-Cleve.-Chicago-Birm. base per 100 lb. keg in carloads

Standard wire nails	$2.45
Cement coated nails	$2.45
(Per pound)	
Polished staples	3.15c
Galv. fence staples	3.40c
Barbed wire, galv.	3.20c
Annealed fence wire	2.95c
Galv. fence wire	3.35c
Woven wire fencing (base C. L. column)	67.00
Single loop bale ties, (base C. L. column)	56.00

To Manufacturing Trade

Base, Pitts. - Cleve. - Chicago-Birmingham (except spring wire)

Bright bess., basic wire	2.60c
Galvanized wire	2.65c
Spring wire	3.20c

Worcester, Mass., $2 higher on bright basic and spring wire.

Cut nails, C. L. Pitts. (10% disc. on all extras) $3.60

Cold-Finished Bars

	Carbon	Alloy
Pittsburgh	2.70c	3.40c
Chicago	2.70c	3.40c
Gary, Ind.	2.70c	3.40c
Detroit	2.75c	*3.50c
Cleveland	2.70c	3.40c
Buffalo	2.70c	3.40c

* Delivered.

Alloy Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.80c

Detroit, delivered 2.90c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20
4100	0.15 to 0.25 Mo.		0.55
4600	0.20 to 0.30 Mo. 1.50-2.00 Ni.		1.10
5100	0.80-1.10 Cr.		0.45
5100	Cr. spring flats		0.15
6100	bars		1.20
6100	spring flats		0.85
Cr. N., Van.			1.50
Carbon Van.			0.85
9200	spring flats		0.15
9200	spring rounds, squares		0.40

Electric furnace up 50 cents.

Piling

Pittsburgh	2.40c
Chicago, Buffalo	2.40c
Gulf ports	2.75c

Strip and Hoops

(Base, hot-rolled, 1 to 25 tons; cold-rolled, 3 to 25 tons)

Hot strip to 23⅞-in.

Pittsburgh, Chicago, Gary, Cleveland Youngstown, Middletown, Birmingham	1.95c
Detroit, del.	2.05c
Philadelphia, del.	2.27c
New York, del.	2.31c
Cooperage hoop, Youngs., Pitts., Chicago, Birm.	2.25c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland, Youngstown	2.75c
Chicago	2.85c
Detroit, del.	2.85c
Worcester, Mass.	2.95c

Carbon	Cleve.	Pitts.
0.26—0.50		2.75c
0.51—0.75		4.10c
0.76—1.00		5.95c
Over 1.00		8.15c

Worcester, Mass., $4 higher.

Commodity Cold-Rolled Strip	
Pitts.-Cleve.-Youngstown	2.90c
Detroit, del.	3.00c
Worcester, Mass.	3.30c

Lamp stock up 10 cents.

Rails, Fastenings

(Gross Tons)

Standard rails, mill	$40.00
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pitts., Chicago, B'ham.	$40.00
Do., rerolling quality	39.00
Angle bars, billet, mills	2.70c
Do., axle steel	2.35c
Spikes, R. R. base	3.00c
Track bolts, base	4.15c
Car axles forged, Pitts., Chgo., B'ham.	3.15c
Tie plates, base	$43.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists, car oads 5% up; full containers additional 10%.

Carriage and Machine

½ x 6 and smaller	65-5-5 off
Do. larger, to 1-in.	60-10-5 off
Do. 1⅛ and larger	60-5-5 off
Tire bolts	50-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-12½ off; bulk 85 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5-5 off
Elevator bolts	50-10-5-5 off
Plow bolts	65-5-5 off

Nuts

Semifinished hex.	U.S.S.	S.A.E.
¼-⅞-in., incl.	65-10	70-5
½-⅞-in., incl.	65-5	70
¾-1-in., incl.	60-10	65
1⅛ and larger	60-5	60-5

Hexagon Cap Screws

Milled	50-10-5 off
Upset, 1-in. smaller	67½-10 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	70-10 off

Rivets, Washers

Structural, Pittsburgh, Cleveland	3.40c
Structural, Chicago	3.40c
7/16-inch and smaller, Pitts., Chi., Cleve.	65-10 off
Wrought washers, Pitts., Chi., Phila., to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75 off	
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe. Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	63½	54
¾	66½	58
1—3	68½	60½

Iron

¾	30	13
1—1¼	34	19
1½	38	21½
2	37½	21

Lap Weld

Steel

2	61	52½
2½—3	64	55½
3½—6	66	57½
7 and 8	65	55½
9 and 10	64½	55
11 and 12	63½	54

Iron

2	30½	15
2½—3½	31½	17½
4	33½	21
4½—8	32½	20
9—12	28½	15

Line Pipe

Steel

1 to 3, butt weld	67½
2, lap weld	60
2½ to 3, lap weld	63
3½ to 6, lap weld	65
7 and 8, lap weld	64
10-inch lap weld	63½
12-inch, lap weld	62½

Iron

	Blk.	Galv.
⅜ butt weld	25	7
1 and 1¼ butt weld	29	13
1½ butt weld	33	15½
2 butt weld	32½	15
1½ lap weld	23½	7
2 lap weld	25½	9
2½ to 3½ lap weld	26½	11½
4 lap weld	28½	15
4½ to 8 lap weld	27½	14
9 to 12 lap weld	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Welded

Sizes	Gage	Steel	Charcoal Iron
1½" O. D.	13	$ 9.72	$23.71
1¾" O. D.	13	11.06	22.93
2" O. D.	13	12.38	19.35
2¼" O. D.	13	13.79	21.68
2¼" O. D.	12	15.16	....
2½" O. D.	12	16.58	26.57
2¾" O. D.	12	17.54	29.00
3" O. D.	12	18.35	31.36
3½" O. D.	11	23.15	39.81
4" O. D.	10	28.66	49.90
5" O. D.	9	44.25	73.93
6" O. D.	7	68.14	....

Seamless

Sizes	Gage	Hot Rolled	Cold Drawn
1" O. D.	13	$ 7.82	$ 9.01
1¼" O. D.	13	9.26	10.67
1½" O. D.	13	10.23	11.79
1¾" O. D.	13	11.64	13.42
2" O. D.	13	13.04	15.03
2¼" O. D.	13	14.54	16.76
2¼" O. D.	12	16.01	18.45
2½" O. D.	12	17.54	20.21
2¾" O. D.	12	18.59	21.42
3" O. D.	12	19.50	22.48
3½" O. D.	11	24.62	28.37
4" O. D.	10	30.54	35.20
4½" O. D.	10	37.35	43.04
5" O. D.	9	46.87	54.01
6" O. D.	7	71.96	82.93

Cast Iron Pipe

Class B Pipe—Per Net Ton

6-in., & over, Birm.	$42.00-43.00
4-in., Birmingham	45.00-46.00
4-in., Chicago	53.80-54.80
6-in. & over, Chicago	50.80-51.80
6-in. & over, east fdy.	46.00
Do., 4-in.	49.00

Class A Pipe $3 over Class B Stnd. fittgs., Birm., base $100.00

Semifinished Steel

Rerolling Billets, Slabs

(Gross Tons)

Pittsburgh, Chicago, Gary, Clev., Buffalo, Young., Birm., Sparrows Point	$34.00
Duluth (billets)	36.00
Detroit, delivered	36.00

Forging Quality Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	40.00
Duluth	42.00

Sheet Bars

Pitts., Cleveland, Young., Sparrows Point, Buffalo, Canton, Chicago	34.00
Detroit, delivered	36.00

Wire Rods

Pitts., Cleveland, Chicago, Birmingham No. 5 to ⅜-inch incl.	43.00
Do., over ⅜ to 41/64-in. incl.	48.00

Worcester up $2; Galveston up $6; Pacific Coast up $9.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	1.90c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75
Connellsville, fdry.	4.75- 5.50
Connell. prem. fdry.	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.50- 5.75
Wise county fur.	4.50- 4.75

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	9.75
Chicago, del.	10.50
Milwaukee, ovens	10.50
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.00
Indianapolis, del.	10.00
Cincinnati, del.	9.75
Cleveland, del.	10.30
Buffalo, del.	10.50
Detroit, del.	10.25
Philadelphia, del.	10.65

Coke By-Products

Spot, gal., freight allowed east of Omaha

Pure and 90% benzol	16.00c
Toluol, two degree	22.00c
Solvent naphtha	26.00c
Industrial xylol	26.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
Do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes, balls, bbls. to jobbers	5.75c
Per ton, bulk, f.o.b. port	
Sulphate of ammonia	$27.25

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$22.00	$22.50	$21.50	$23.00
Birdsboro, Pa.	22.00	22.50	21.50	23.00
Birmingham, Ala.‡	17.38	.....	16.38	22.00
Buffalo	21.00	21.50	20.00	22.00
Chicago	21.00	21.00	20.50	21.50
Cleveland	21.00	21.00	20.50	21.50
Detroit	21.00	21.00	20.50	21.50
Duluth	21.50	21.50	.....	22.00
Erie, Pa.	21.00	21.50	20.50	22.00
Everett, Mass.	22.75	23.25	22.25	23.75
Granite City, Ill.	21.00	21.00	20.50	21.50
Hamilton, O.	21.00	21.00	20.50	.....
Neville Island, Pa.	21.00	21.00	20.50	21.50
Provo, Utah	19.00	.....	.....	.....
Sharpsville, Pa.	21.00	21.00	20.50	21.50
Sparrow's Point, Md.	22.00	.....	21.50	.....
Swedeland, Pa.	22.00	22.50	21.50	23.00
Toledo, O.	21.00	21.00	20.50	21.50
Youngstown, O.	21.00	21.00	20.50	21.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	22.39	22.39	21.89	22.89
Baltimore from Birmingham	22.78	.....	21.66	.....
Boston from Birmingham	22.87	.....	.....	.....
Boston from Everett, Mass.	23.25	23.75	22.75	24.25
Boston from Buffalo	23.25	23.75	22.75	24.25
Brooklyn, N. Y., from Bethlehem	24.50	25.00	.....	.....
Canton, O., from Cleveland	22.39	22.39	21.89	22.89
Chicago from Birmingham	†21.22	.....	.....	.....
Cincinnati from Hamilton, O.	21.44	22.11	21.61	.....
Cincinnati from Birmingham	21.06	.....	20.06	.....
Cleveland from Birmingham	21.32	.....	20.82	.....
Mansfield, O., from Toledo, O.	22.94	22.94	22.44	22.44
Milwaukee from Chicago	22.10	22.10	21.60	22.60
Muskegon, Mich., from Chicago, Toledo or Detroit	24.19	24.19	23.69	24.69
Newark, N. J., from Birmingham	23.15	.....	.....	.....
Newark, N. J., from Bethlehem	23.53	24.03	.....	.....
Philadelphia from Birmingham	22.46	.....	21.96	.....
Philadelphia from Swedeland, Pa.	22.84	23.34	22.34	.....
Pittsburgh district from Neville Island	Neville base, plus 69c, 84c, and $1.24 freight.			
Saginaw, Mich., from Detroit	23.45	23.45	22.95	22.95

	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	21.50	21.50	21.00	.....
St. Louis from Birmingham	†21.12	.....	20.62	.....
St. Paul from Duluth	23.63	23.63	.....	24.13

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $26.50, Phil, base, standard and copper bearing, $27.63.

Gray Forge		Charcoal	
Valley furnace	$20.50	Lake Superior fur.	$25.00
Pitts. dist. fur.	20.50	do., del. Chicago	28.34
		Lyles, Tenn.	23.50

Silvery†

Jackson count, O., base: 6-6.50 per cent $25.50; 6.51-7—$26.00; 7-7.50—$26.50; 7.51-8—$27.00; 8-8.50—$27.50; 8.51-9—$28.00; 9-9.50—$28.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky.	$60.80

First Quality

Pa., Ill., Md., Mo., Ky.	47.50
Alabama, Georgia	47.50
New Jersey	52.50

Second Quality

Pa., Ill., Ky., Md., Mo.	42.75
Georgia, Alabama	34.20
New Jersey	49.00

Ohio

First quality	39.90
Intermediate	36.10
Second quality	31.35

Malleable Bung Brick

All bases	$56.05

Silica Brick

Pennsylvania	$47.50
Joliet, E. Chicago	56.05
Birmingham, Ala.	47.50

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press	$28.00
Wire cut	$26.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Do. domestic	40.00
Do., f.o.b. Chewelah, Wash., net ton, bulk	22.00
net ton, bags	26.00
Quickset magnesite grains, f.o.b. Chewelah, Wash., net ton, bulk	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$47.00
Chem. bonded chrome	47.00
Magnesite brick	67.00
Chem. bonded magnesite	57.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20, barge	$22.00
No. 2 lump	22.00-23.00

Ferroalloy Prices

Ferromanganese, 78-82%, tidewater, duty pd. $92.50
Do., del. Pittsburgh 97.77

Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 28.00
Do., New Orleans 28.00
Do., 26-28%, Palmerton 33.00

Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.

Silicoman, 2½ carbon 97.75
2% carbon 102.75 1% 112.75
Contract ton price $11 higher; spot $5 over contract.

Ferrotungsten, stand., lb. con. del. cars 1.60-1.65

Ferrovanadium, 35 to 40%, lb., cont. 2.70-2.80

Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage, 58.50; electrolytic, per ton, c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00

Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. carlots 10.50c
Do., ton lots 11.25c
Do., less-ton lots 11.50c

67-72% carloads, 2% carbon, per lb. contained chrome 16.50c
Do., ton lots 17.25c
Do., less-ton lots 17.50c

	Carloads	Ton lots	Less ton
2% carb.	16.50c	17.25c	17.50c
1% carb.	17.50c	18.25c	18.50c
0.10% carb.	18.50c	19.25c	19.50c
0.20% carb.	19.50c	20.25c	20.50c

Spot ¼c higher

Ferromolybdenum, 55-65% molyb. cont., f.o.b. mill, lb. 0.95

Calcium molybdate, lb. molyb. cont., f.o.b. mill 0.80

Ferrotitanium, 40%, lb. con. ti., ton lots $1.23
Do., less-ton lots 1.25
20-25% carbon, 0.10 max., ton lots, lb. 1.35
Do, less-ton lots 1.40
Spot 5c higher

Ferrocolumbium, 50-55%, contract, lb. con. col., f.o.b. Niagara Falls $2.25
Do, less-ton lots 2.30
Spot is 10c higher

Technical molybdenum trioxide, 53 to 60% molybdenum, lb. molyb. cont., f.o.b. mill 0.80

Ferro-carbon-titanium, 15-18%, ti., 6-8% carb., carlots, contr., net ton $142.50
Do, spot 145.00
Do, contract, ton lots 145.00
Do, spot, ton lots 150.00

15-18% ti., 3-5% carbon, carlots, contr., net ton 157.50
Do, spot 160.00
Do, contract, ton lots. 160.00
Do, spot, ton lots 165.00

Alsifer, contract carlots, f.o.b. Niagara Falls, lb. 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c
Spot ½c lb. higher

Chromium Briquets, contract carloads, freight allowed, lb. 7.25c
Do, spot carlots, bulk 7.50c
Do, ton lots 8.00c
Do, less-ton lots 8.50c

Tungsten Metal Powder, according to grade, spot shipment, 200-lb. drum lots, lb. $2.05
Do, smaller lots 2.15

Vanadium Pentoxide, contract, lb. contained $1.10
Do, spot 1.15

Chromium Metal, 98% cr., 0.50 carbon max., contract, lb. con. chrome 80.00c
Do, spot 85.00c

88% chrome, contract 79.00c
Do, spot 84.00c

Silicon Metal, 1% iron, contract, lb. 14.50c
Do, 2% 13.00c
Spot ¼c higher

Silicon Briquets, contract, carloads, freight allowed, ton $69.50
Carload, spot 74.50
Less-ton lots, lb. 3.75c

Manganese Briquets, contract carloads, freight allowed lb. 4.75c
Ton lots 5.25c
Less-ton lots 5.50c
Spot ¼c higher

Zirconium Alloy, 12-15%, carloads, gross ton $97.50
Do, spot 102.50

34-40%, contract, carloads, lb., alloy 14.00c
Do, ton lots 15.00c
Do, less-ton lots 16.00c
Spot ¼c higher

Molybdenum Powder, 99%, f.o.b. York, Pa. 200-lb. kegs, lb. $2.60
Do, 100-200 lb. lots 2.75
Do, under 100-lb. lots 3.00

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-in. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled	Sheets: Cold Rolled	Sheets: Galv. No. 24
Boston	3.98	4.21	5.21	3.85	3.85	5.66	3.86	4.93	4.76
New York (Metropolitan)	3.94	4.11	4.11	3.76	3.75	5.56	3.73	4.90	4.40
Philadelphia	3.60	3.60	4.10	3.40	3.40	5.00	3.40	....	4.50
Baltimore	3.80	3.95	4.35	3.65	3.65	5.00	3.70	5.05	4.30
Norfolk, Va.	4.00	4.15	4.55	3.85	3.85	5.20	3.90	4.80	5.40
Buffalo	3.60	3.97	3.97	3.77	3.55	5.40	3.50	4.55	4.40
Pittsburgh	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.60	4.50
Cleveland	3.50	3.65	3.65	3.55	3.73	5.33	3.50	4.70	4.62
Detroit	3.68	3.83	3.83	3.75	3.80	5.42	3.58	4.65	4.74
Cincinnati	3.85	3.82	3.82	3.80	3.83	5.43	3.57	....	4.57
Chicago	3.60	3.75	3.75	3.55	3.55	5.15	3.50	4.45	4.50
Minneapolis	3.85	4.00	4.00	3.80	3.80	5.40	3.75	5.10	4.75
Milwaukee	3.73	3.88	3.88	3.68	3.68	5.28	3.63	4.58	4.63
St. Louis	3.87	4.02	4.02	3.82	3.82	5.42	3.77	4.72	4.77
Kansas City	4.15	4.30	4.30	4.10	4.10	5.70	4.10	....	4.75
Memphis	4.01	4.16	4.16	3.96	3.96	5.71	3.91	....	5.26
Chattanooga	3.90	4.05	4.05	3.85	3.85	5.80	3.80	....	4.40
Tulsa, Okla.	4.64	4.79	4.79	4.59	4.59	6.19	4.54	....	5.54
Birmingham, Ala.	3.50	3.65	3.65	3.45	3.45	5.83	3.40	....	4.75
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	....	5.15
Houston, Tex.	3.50	5.85	6.25	4.05	4.05	5.65	4.20	....	5.25
Seattle	4.30	4.50	5.85	4.05	4.15	5.90	4.20	....	5.50
Portland, Oreg.	4.30	4.70	6.10	4.15	4.15	5.90	3.75	6.50	4.75
Los Angeles	4.00	4.50	6.35	4.00	4.00	6.20	4.20	6.30	5.05
San Francisco	4.05	4.45	6.00	3.85	3.95	5.45	4.00	6.40	5.15

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.61	4.43	4.28	7.65	6.25	6.00	8.05	8.73	7.33
New York	3.66	4.39	4.14	7.50	6.10	5.85	....	8.69	7.29
Philadelphia	3.66	4.36	3.85	7.46	6.06	5.81	8.71	....	....
Baltimore	....	4.35	3.95	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.57	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Pittsburgh	3.35	3.95	3.80	7.35	5.95	5.70	7.75	8.35	6.95
Cleveland	3.35	4.05	3.70	7.45	6.05	6.05	7.85	8.25	6.85
Detroit	3.55	4.10	3.83	7.57	6.17	5.92	7.39	8.55	7.15
Cincinnati	3.60	4.30	3.90	7.59	6.19	5.94	8.99	8.60	7.20
Chicago	3.65	4.05	3.80	7.25	5.85	5.60	7.65	8.25	6.85
Minneapolis	....	4.64	4.00	7.60	6.20	8.79	9.34	8.94	7.54
Milwaukee	....	4.18	3.93	7.48	6.08	5.83	7.88	8.48	7.08
St. Louis	3.76	4.32	4.07	7.62	6.22	5.97	8.02	8.62	7.22
Kansas City	4.46	4.60	....	....	....	....	....	....	....
Memphis	....	4.61	....	....	....	....	....	....	....
Chattanooga	....	4.90	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.09	....	....	....	....	....	....	....
Birmingham, Ala.	....	4.73	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Seattle	....	5.60	5.65	...	7.80	7.65	8.45	....	....
Portland, Oreg.	.. .	5.60	6.10	9.00	8.00	7.85	8.70	....	....
Los Angeles	4.45	6.60	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	*9.30	6.55	5.20	9.65	8.80	8.65	9.30	10.65	9.80

* Based on minimum quantity.

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Oct. 13

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental North Sea ports, gross tons: Quoted in dollars at current value	Continental North Sea ports, gross tons: **Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$26.01 5 10 0	$17.70	2 2 0
Basic bessemer	.....	18.76	2 4 6
Hematite, Phos. .03-.05	30.74 6 10 0*	.....	.....
Billets	$37.25 7 17 6	$35.83	4 5 0
Wire rods, No. 5 gage	53.33 11 5 6	43.20	5 2 6
Standard rails	$47.89 10 2 6	$48.47	5 15 0
Merchant bars	2.32c 11 0 0	1.95c to 2.00c	5 2 6 to 5 5 0
Structural shapes	2.24c 10 12 6	1.85c	4 17 6
Plates, †¼ in. or 5 mm.	2.44c 11 11 3	2.14c to 2.33c	5 12 6 to 6 2 6
Sheets, black, 24 gage or 0.5 mm.	2.74c 13 0 0	2.85c	7 10 0°
Sheets, gal., 24 ga., corr.	3.32c 15 15 0	3.37c	8 17 6
Bands and strips	2.80c 13 5 0	2.19c	5 15 0
Plain wire, base	4.11c 19 10 0	2.33c to 2.76c	6 2 6 to 7 5 0
Galvanized wire, base	4.91c 23 5 0	2.99c to 3.09c	7 17 6 to 8 2 6
Wire nails, base	3.90c 18 10 0	2.66c to 2.85c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$ 4.79 1 0 3	.....	.....

British ferromanganese $92.50 delivered Atlantic seaboard duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d		French Francs		Belgian Francs		Reich Mark
Fdy. pig iron, Si. 2.5	$25.78	5 9 0(a)	$15.85	598	$15.55	460	$25.24	63
Basic bess. pig iron	23.65	5 0 0(a)	.....	.....	.....	...	27.85	(b)69.50
Furnace coke	6.50	1 7 6	5.43	205	2.29	215	7.61	19
Billets	37.25	7 17 6	22.26	840	29.15	860	38.67	96.50
Standard rails	2.14c	10 2 6	1.38c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.57c	12 4 0††	1.30c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.33c	11 0 6††	1.27c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.47c	11 14 3††	1.62c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.32c	15 15 0§	1.92c	1,600‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.90c	18 10 0	2.70c	2,250	4.13c	2,750	6.66c	370
Plain wire	4.11c	19 10 0	1.98c	1,650	2.48c	1,650	3.11c	173
Bands and strips	2.73c	12 19 0††	1.45c	1,210	1.95c	1,300	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. 5s rebate to approved customers. (b) hematite. °Close annealed ††Rebate of 15s on certain conditions.

**Gold pound sterling carries a premium of 73 per cent over paper sterling.

—The Market Week—

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	†11.00
Bos. dock No. 1 exp.	13.00-13.25
New Eng. del. No. 1	13.00
Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	12.00-12.50
Chicago, No. 1	12.50-13.00
Chicago, auto, no alloy	11.00-11.50
Chicago, No. 2 auto	10.00-10.50
Cincinnati, dealers	11.25-11.75
Cleveland, No. 1	12.50-13.00
Cleveland, No. 2	11.00-11.50
Detroit, No. 1	9.50-10.00
Detroit (industrial)	11.00-11.50
Eastern Pa., No. 1	14.50-15.00
Eastern Pa., No. 2	13.00-13.50
Federal, Ill.	12.00-12.50
Granite City, R. R.	12.50-13.00
Granite City, No. 2	12.00-12.50
Los Angeles, No. 1	11.50-12.00
Los Angeles, No. 2	10.00-10.50
N. Y. dock No. 1 exp.	11.50-12.00
Pitts., No. 1 (R. R.)	15.75-16.25
Pittsburgh, No. 1	14.75-15.25
Pittsburgh, No. 2	13.50-14.00
St. Louis, R. R.	12.00-12.50
St. Louis, No. 2	11.50-12.00
San Francisco, No. 1	12.00
Seattle, No. 1	10.00-12.00
Toronto, dlrs. No. 1	10.00-10.50
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo	12.00-12.50
Chicago, factory	11.75-12.25
Chicago, dealer	10.25-10.75
Cincinnati, del.	10.00-10.50
Cleveland	12.00-12.50
Detroit	11.50-12.00
E. Pa., new mat.	14.50-15.00
E. Pa., old mat.	10.00-10.50
Los Angeles	12.50-13.00
Pittsburgh	14.75-15.25
St. Louis	10.00-10.50
Valleys	13.00-13.50

BUNDLED SHEETS

Buffalo, No. 1	12.00-12.50
Buffalo, No. 2	11.00-11.50
Cleveland	10.00-10.50
Los Angeles	11.00-11.50
Pittsburgh	13.50-14.00
St. Louis	7.50- 8.00
Toronto, dealers	4.00

SHEET CLIPPINGS, LOOSE

Chicago	8.50- 9.00
Cincinnati, dealers	6.00- 6.50
Detroit	8.50- 9.00
†Los Angeles	3.75- 4.00
St. Louis	7.00- 7.50

BUSHELING

Buffalo, No. 1	12.00-12.50
Chicago, No. 1	11.50-12.00
Cincin., No. 1, deal.	6.50- 7.00
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	7.25- 7.75
Detroit, No. 1, new	10.50-11.00
Valleys, new, No. 1	13.00-13.50
Toronto, dealers	4.00

MACHINE TURNINGS (Long)

Birmingham	†4.50- 5.00
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.75- 4.25
Cleveland	7.00- 7.50
Detroit	5.50- 6.00
Eastern Pa.	8.50- 9.00
Los Angeles	4.00- 4.25
New York	†3.50- 4.00
Pittsburgh	9.50-10.00
St. Louis	4.00- 4.50
Toronto, dealers	4.25- 4.75
Valleys	8.50- 9.00

SHOVELING TURNINGS

Buffalo	8.00- 8.50
Cleveland	7.50- 8.00
Chicago	7.00- 7.50
Detroit	6.50- 7.00
Pittsburgh	10.50-11.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	2.00
Buffalo	7.00- 7.50
Cincinnati, dealers	3.25- 3.75
Cleveland	7.50- 8.00
Eastern Pa.	6.00- 6.50
Detroit	5.50- 6.00
New York	†2.50- 3.00
Pittsburgh	8.50- 9.00
Toronto, dealers	3.50

AXLE TURNINGS

Boston district	†7.50
Buffalo	9.50-10.00
Chicago, elec. fur.	10.75-11.25
Eastern Pa.	10.50-11.00
St. Louis	9.00- 9.50
Toronto	5.00

CAST IRON BORINGS

Birmingham	†6.00- 6.50
Boston dist. chem.	†6.00- 6.25
Buffalo	7.00- 7.50
Chicago	5.50- 6.00
Cincinnati, dealers	3.25- 3.75
Cleveland	7.25- 7.75
Detroit	5.50- 6.00
E. Pa., chemical	10.00-11.00
New York	†3.50- 4.00
St. Louis	3.00- 3.50
Toronto, dealers	3.50

RAILROAD SPECIALTIES

Chicago	15.50-16.00

ANGLE BARS—STEEL

Chicago	14.00-14.50
St. Louis	14.00-14.50

SPRINGS

Buffalo	16.00-16.50
Chicago, coil	15.75-16.25
Chicago, leaf	14.50-15.00
Eastern Pa.	16.50-17.00
Pittsburgh	16.50-17.00
St. Louis	15.00-15.50

STEEL RAILS, SHORT

Birmingham	†12.00-12.50
Buffalo	17.00-17.50
Chicago (3 ft.)	15.25-15.75
Chicago (2 ft.)	15.75-16.25
Cincinnati, dealers	16.00-16.50
Detroit	16.50-17.00
Los Angeles	15.00-17.50
Pitts., 3 ft. and less	16.75-17.25
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†13.50-14.00
Buffalo	16.00-16.50
Chicago	13.00-13.50
Cleveland	17.00-17.50
Pittsburgh	16.00-16.50
St. Louis	13.50-14.00
Seattle	16.00

FROGS, SWITCHES

Chicago	13.00-13.50
St. Louis, cut	13.50-14.00

ARCH BARS, TRANSOMS

St. Louis	15.00-15.50

PIPE AND FLUES

Cincinnati, dealers	6.00- 6.50
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	10.00-10.50
Chicago, net	7.00- 7.50
Cincinnati, dealers	6.75- 7.25
Eastern Pa.	13.50
New York	†8.50- 9.00
St. Louis	8.50- 9.00

RAILROAD WROUGHT

Birmingham	†11.00-11.50
Boston district	†9.50-10.00
Chicago, No. 1 net	8.50- 9.00
Eastern Pa., No. 1	15.00-15.50
St. Louis, No. 1	10.75-11.25
St. Louis, No. 2	12.00-12.50
Toronto, No. 1 dlr.	10.00

FORGE FLASHINGS

Boston district	†7.25- 7.75
Buffalo	12.00-12.50
Cleveland	11.50-12.00
Detroit	9.00- 9.50
Los Angeles	9.00
Pittsburgh	13.00-13.50

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.00-15.50

LOW PHOSPHORUS

Buffalo, crops	16.50-17.00
Cleveland, crops	18.00-18.50
Eastern Pa., crops	16.50-17.00
Pittsburgh, crops	17.00-17.50

LOW PHOS. PUNCHINGS

Buffalo	15.50-16.00
Chicago	15.50-16.00
Eastern Pa.	17.00-17.50
Pitts. (light & hvy.)	15.50-16.00
Seattle	15.00

RAILS FOR ROLLING

5 feet and over

Birmingham	†14.00-15.00
Boston	15.00-15.50
Chicago	16.00-16.50
New York	†15.00-15.50
Eastern Pa.	17.00-17.50
St. Louis	16.50-17.00

STEEL CAR AXLES

Birmingham	†15.00-16.00
Buffalo	16.50-17.00
Boston district	†16.00
Chicago, net	18.50-19.00
Eastern Pa.	21.50-22.50
St. Louis	18.50-19.00

LOCOMOTIVE TIRES

Chicago (cut)	14.50-15.00
St. Louis, No. 1	14.00-14.50

SHAFTING

Boston district	†14.75-15.00
New York	†15.00-15.50
Eastern Pa.	19.50-20.00
St. Louis, 1¼-3¾"	17.00-17.50

CAR WHEELS

Birmingham	†13.50-14.00
Boston dist., iron	†11.00
Buffalo, steel	16.50-17.00
Chicago, iron	12.50-13.00
Chicago, rolled steel	14.50-15.00
Cincin., iron, deal.	13.25-13.75
Eastern Pa., iron	16.50-17.00
Eastern Pa., steel	16.50-17.00
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	16.50-17.00
St. Louis, iron	13.75-14.25
St. Louis, steel	15.00-15.50

NO. 1 CAST SCRAP

Birmingham	†12.50-13.00
Boston, No. 1 mach.	†11.00-11.50
N. Eng. del. No. 2	11.50-12.00
N. Eng. del. textile	12.50-13.00
Buffalo, cupola	14.50-15.00
Buffalo, mach.	15.50-16.00
Chicago, agri. net	10.75-11.25
Chicago, auto net	11.50-12.00
Chicago, railr'd net	11.00-11.50
Chicago, mach. net	11.75-12.25
Cincin., mach. deal.	11.75-12.25
Cleveland, mach. net	16.75-17.25
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.00-14.50
Los Angeles, net	13.50-14.00
Pittsburgh, cupola	15.00-15.50
San Francisco, del.	13.50-14.00
Seattle	10.00-12.00
St. Louis, cupola	12.00-12.50
St. L., No. 1, mach.	14.00-14.50
St. Louis, agr. mach.	12.75-13.25
Toronto, No. 1, mach., net	11.00-12.00

HEAVY CAST

Boston dist. break.	†10.75-11.00
New England, del.	12.50-13.00
Buffalo, break.	11.00-11.50
Cleveland, break. net	13.00-13.50
Detroit, auto net	11.50-12.00
Detroit, break	9.50-10.00
Eastern Pa.	16.00-16.50
Los Ang., auto, net	13.00-13.50
New York, break.	†11.00-11.50
Pittsburgh, break	13.00-13.50

STOVE PLATE

Birmingham	†7.50- 8.00
Boston district	†8.00- 8.25
Buffalo	13.00-13.50
Chicago, net	7.50- 8.00
Cincinnati, dealers	6.75- 7.25
Detroit, net	8.50- 9.00
Eastern Pa.	13.50
New York, fdy.	†10.00-10.50
St. Louis	10.00-10.50
Toronto, dealers, net	7.50- 8.00

MALLEABLE

Birmingham, R. R.	†10.50-11.00
New England, del.	14.50-15.00
Buffalo	13.50-14.00
Chicago, R. R.	13.50-14.00
Cincin., agri. deal.	11.25-11.75
Cleveland, rail	15.00-15.50
Eastern Pa., R. R.	15.50-16.00
Los Angeles	17.50-18.00
Pittsburgh, rail	14.50-15.00
St. Louis, R. R.	12.00-12.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.	
Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, c.i.f. Atlantic	
Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00
No. Afr. low phos.	13.00
Swedish low phos.	13.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten. sh. ton. unit, duty pd. nom.	$21.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$24.50-25.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	35.00
So. African, 50-52% nom.	35.00
Indian, 50-52%	Nominal

Sheets

Sheet Prices, Page 78

Pittsburgh—Open reductions of $4 a ton on base prices for most grades of sheets have followed recent shading on automotive purchases. Lower quotations affect hot and cold-rolled sheets, enameling sheets, long ternes and manufacturing ternes. Following a price cut of $3 a ton last June, this is a total reduction for the year of $7, to which must be added the loss to mills incurred by changes in the basing point system. For Detroit delivery, base prices of sheets shipped from Pittsburgh are down $9 a ton since earlier this year. Automotive demand lately has predominated business which has pushed production of common and full finished sheets to 50 per cent, best rate in 11 months. Galvanized sheet output is steady at 65 per cent.

Cleveland—General weakness in prices for hot and cold-rolled sheets flared into the open last week with mills announcing a reduction of $4 a ton on all new business and on all unshipped tonnage after Oct. 10. Present quotations are subject to change without notice. Rumors persist of still lower prices being offered some consumers. The immediate reaction has been a noticeable decline in new business, as consumers wait for further developments. Base prices on galvanized sheets have not been affected.

Boston—Weakness in several finishes of sheets, evident for some time, has openly spread here, further confusing a mixed situation. Demand for sheets is mounting from more diversified channels with building and storm repair requirements still substantial. Improved demand from industrial consumers, while heavier, develops less briskly. Delivery delays in some sections have not been eliminated. Considerable tonnage of some types of sheets, notably roofing, culvert and galvanized, is being specified for prompt shipment.

New York—Recent reductions in sheets stimulated a fair volume of anticipatory buying, although some consumers are still holding off, first wishing to make sure that the price weakness has run its course. Galvanized sheets were reported down $3 a ton, but this could not be fully substantiated. Certainly such a concession was not general; nor could a report of a $4 concession on tin mill black plate by one producer be confirmed. Mills are quoting current concessions subject to withdrawal without notice. Recent buying includes a substantial tonnage of sheets by the American Car & Foundry Co. for the 1000 steel box cars to be built at its St. Louis shops for the Illinois Central.

Philadelphia—Declaring the reduction of $4 a ton on most grades of sheets may be only temporary, producers are proceeding cautiously in covering customers ahead. Some sellers are willing to sell only for spot delivery, although others are taking business for shipment up to early December. The additional cut means a total reduction to Philadelphia hot-rolled sheet consumers since late May of $12 a ton, due partly to the new Sparrows Point basing point. Automotive sheet releases are fair, and stove and radio industries continue seasonally active.

Buffalo—Recent price reduction of $4 a ton on principal sheet grades is expected to have little effect on automotive demand, in view of previous shading. The lower market is regarded as a possible stimulant to consumption elsewhere, however. The Buffalo base now is 1.95c for hot-rolled sheets and strip and 3.00c for cold-rolled sheets. While new business is light, releases against old orders are fair. Production has declined slightly below the 50 per cent rate of a week ago.

Cincinnati — District producers have reduced hot and cold rolled sheets and long ternes $4 a ton. Effect of the cut has not been immediately defined although demand recently had been gaining. Business of some interests is reported above 60 per cent of capacity. Automotive specifications have played an important part in this latest upturn, although demand from miscellaneous users also has expanded.

St. Louis—Sheet orders are spotty but generally steady. Galvanized sheets are fairly active, particularly heavier grades for roofing and repair work. Stocks of many fabricators are reported low and are expected to be replenished within the next two or three weeks. Specifying by stove interests is less active than a month ago.

Birmingham, Ala. — Production of sheets continues full, due to widespread orders for galvanized sheets. So accentuated has been demand for sheets as to build up a slight backlog, according to reports from mill interests here.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 79

Bolt and nut specifications are moderately active, showing some improvement over September. Increased needs of the automotive industry and railroads and sustained demand for construction work are expected to boost October business to the best level since late spring. Releases from shipyards are fairly active, and prospective work points to a spurt in bolt, nut and rivet orders later this quarter. Outstanding in railroad accessory buying lately is 2000 kegs of track bolts purchased by the New York Central.

Strip

Strip Prices, Page 79

Pittsburgh — Base prices on hot and cold-rolled strip have been reduced $4 a ton. Production is well maintained at 40 per cent of capacity for both products. Demand has recovered, following a recent downward tendency, with automotive releases predominating. Miscellaneous consumers also are ordering in better volume, while business from warehouses is unchanged.

Cleveland—Little new buying has followed reduction of $4 a ton on hot and cold-rolled strip and commodity strip, as consumers delay further purchases until a more suitable market has developed. In some instances users have pushed up releasing dates on unshipped tonnage since the present market is subject to change without notice. Further weakness is reported and users are slow to enter the market.

Boston—Cold strip mills in most instances are busier, several operating full to catch up with shipments delayed by the recent storm. Incoming volume has improved moderately, ranging from 60 to 65 per cent of capacity, with some increase in tonnage from the automobile industry. Expectation that the recent reduction of $4 a ton on hot and cold strip will be temporary and will be firmed up to the old price as soon as automobile builders are fully covered, is the opinion held by producers and numerous consumers. Meanwhile this is being reflected to some extent by miscellaneous users, who are buying more heavily.

New York — Feeling that the current weakness in hot and cold strip prices is temporary, the recent reduction has driven in a fair volume of business from miscellaneous consumers. Releases to automotive partsmakers are also heavier. However, most mills had a considerable number of orders to be shipped, booked at the higher price, on which the lower quotations will apply. Consumers of hot strip are also covering at the lower price more freely. Deliveries from the Worcester, Mass., district mills are now practically normal.

Birmingham, Ala. — While strip, because of easing demand for cotton ties, has shown some slackening, output remains fairly steady.

Plates

Plate Prices, Page 78

Cleveland — Little improvement has developed in demand for standard steel plates. In a few instances shipments this month are below the comparable period during September. Inquiries continue satisfactory but are slow in closing. Demand from railroads is restricted to necessary repairs. Tank and boiler work is also slow in developing. Prices are unchanged.

Chicago—Plate demand is spotty and generally unchanged. Fabricators are ordering for only immediate needs, but there are some indications these requirements will tend upward soon. For some time, the petroleum industry's demand for storage tanks and refining equipment was the largest outlets for fabricated plates, but public works projects recently have come to the fore with heavier needs for dams, waterworks and pipe and tank construction.

Boston—Except for shipbuilding the largest plate inquiry in months involves 11,000 feet of 36-inch steel pipe, for installation in the Dorchester district, Boston, bids being in with the metropolitan district commission. Several other large diameter steel pipe projects are on the boards, enhancing the outlook for plates with shipyard releases steady and in some instances heavier.

New York—While plate consumers obviously are moving with greater caution because of the break in the sheet market, business so far this month has been at a slightly higher rate than in the first half of September. The few outstanding orders include 1300 tons of caissons for foundation work for the criminal court house in this city, the business being placed with an eastern Pennsylvania mill. Approximately 1300 tons for this same project remain to be let through the Raymond Concrete Pile Co., this city.

Philadelphia—A few holdups on plates have been noted as a result of the reduction in sheets. Most platemakers, however, are willing to protect customers in the event of a price decline, which, incidentally, is not expected here.

Washington — Navy department has postponed opening of bids on three battleships from Oct. 19 to Nov. 2.

Birmingham, Ala. — Demand for plates remains fairly steady with most current business originating from tank manufacturers. It is probable the output, however, is somewhat off from the past few weeks.

San Francisco—Western Pipe & Steel Co. has been awarded two pipe lines, totaling 675 tons of 18 to 36-inch welded steel pipe, for Sacramento, Calif. Plate awards for the year to date total 28,292 tons, against 44,464 tons a year ago.

Seattle — No large tonnages are up for figures. Shops report a fair volume of work for boilers, smokestacks and tanks. Construction is proceeding on the plant of the Inland Empire Refineries, at Spokane, Wash. Unstated interests are reported to have booked more than 1000 tons for storage tanks in this project. Bids are expected to be called soon for about 725 tons involved in 10 and 16-inch water pipe projects at Leavenworth and Cle Elum, Wash.

Plate Contracts Placed

1300 tons, caissons, criminal court house, New York City, to Bethlehem Steel Co., Bethlehem, Pa., 1300 tons remain to be placed.

350 tons, 18 to 24-inch welded steel pipe, Sacramento, Calif., to Western Pipe & Steel Co., San Francisco.

325 tons, 30 and 36-inch welded steel pipe, Sacramento, Calif., to Western Pipe & Steel Co., San Francisco.

Plate Contracts Pending

200 tons, standpipe, Newburyport, Mass.

175 tons, standpipe, Webster, Mass.

150 tons, standpipe, Foxboro, Mass.

Unstated tonnage, 300,000-gallon water tank, plus water main extensions, West Bend, Wis.; estimated cost $36,000; bids close about Nov. 1; PWA project.

Unstated tonnage, 100,000-gallon tank and tower, veterans' hospital, Amarillo, Tex.; bids Oct. 25.

Bars

Bar Prices, Page 78

Cleveland—Sellers of commercial and alloy steel bars note continuation of the general upward trend in specifications. The most marked increase has originated from auto partsmakers who have been gradually stepping up production schedules. Agricultural equipment concerns have also entered the market for increasing tonnages recently.

Chicago — Commercial and alloy bars are particularly involved in recent market improvements noted here. More tonnage of bars is now being moved toward automotive interests and bar producers feel this source will continue to expand requirements this fall.

Boston—Demand for commercial steel, forging and alloy bars has improved slightly, but buying is held to small lots for prompt delivery with consumers releasing tonnage little beyond immediate requirements. Cold finished requirements for the textile equipment industry and arsenal shops are mildly heavier. Forging shop schedules are spottily improved. Jobbers are confining purchases to rounding out scatered open gaps in stocks, but shipyard needs are steady and tend upward.

New York—Bar tonnages recently have lagged, due in a measure to hesitancy by consumers until they see what effect recent reductions in sheet and strip will have upon general steel prices. Considering business for the month to date, the volume is better than the corresponding period of September, despite the recent lag.

Philadelphia — Specifications for merchant bars are somewhat less active although warehouses have placed a few fair lots. Prices so far are being firmly maintained.

Buffalo — Activity in bars is receiving its main support from structural and miscellaneous inquiries. Automotive manufacturers are calling for only relatively small lots, but bar producers are hopeful that motor orders will increase sufficiently to offset any falling off in miscellaneous demand the next few weeks.

Birmingham, Ala.—Bars continue a bright spot, particularly reinforcing bars. The business, according to mill sources, is coming from a great variety of sources, none of it in individually large orders.

Pipe

Pipe Prices, Page 79

Pittsburgh — Pipe business is improving slightly, and in some divisions is regarded as satisfactory. Production for the industry as a whole is estimated at 45 to 50 per cent. Considerable betterment is noted in mechanical tubing activity, largely the result of increased automotive operations. Standard pipe orders are heavier, aided by home building and repairs. Oil country goods are moving at an unchanged but fairly active rate, while boiler tubes lately have been in better demand.

Cleveland — Shipments of standard steel pipe from jobbers' stocks have made encouraging gains so far this month. Outstanding award of the week went to Bethlehem Steel Co., Bethlehem, Pa., for 200 tons of 42-inch steel pipe for the west approach to the Main street bridge, Cleveland. No award has been made on the 1000 tons of 42-inch steel pipe for the new intake at Sandusky, O.

Chicago — The market for cast iron pipe is slightly improved but volume of demand is still low. With

the approach of the usual slack season betterment is the basis for belief the market for the fall and early winter months will not be as dull as originally anticipated. Further PWA allotments are responsible in part for a heavier influx of jobs on which to figure, although in few cares are individual jobs of substantial tonnage.

Boston — Newton, Mass., has closed on 750 tons of 30-inch, the largest cast iron pipe purchase. Several inquiries approximating 200 tons each are also up for figures. Bath, Me., closes Oct. 18 on 16-inch for a submarine crossing under the Kennebec river. Merchant steel pipe is moving steadily and in spots slightly better with resale prices generally held, but with some shading in Connecticut. The Florence, N. J., foundry has booked 550 tons in this district.

New York — The pipe market is devoid of outstanding inquiries, except for several thousand tons pending and in prospect for various housing projects. Increasing amount of culvert specifications is noted for rehabilitation work on Long Island and lower New England, damaged by the recent hurricane. Resale prices continue unsettled.

Cast pipe buying has slackened mostly in small lots. Foundries in the East are fairly active on old orders, including the last New York city purchase on which deliveries still lag. Hydrant and fittings shipments in the same purchase are also slow and one foundry has farmed out part of the work.

Birmingham, Ala. — Long expected business from WPA and PWA has started but not in sufficient volume to cause increase of production.

San Francisco — With individual orders limited to less than 100 tons, total bookings of cast iron pipe failed to exceed 250 tons, but orders for the year to date continue moderately ahead of last year. Several fairly large orders are pending for both cast iron and steel pipe.

Seattle—Many Pacific Northwest communities have voted bonds to match federal funds for water system improvements. These projects are expected to stimulate the demand for cast iron goods within 60 days but at the moment no large tonnages are up for figures. Seattle has called bids Oct. 20 for 100 tons of 8-inch cast iron. Leavenworth and Cle Elum, Wash., will call bids soon for about 500 tons of 4 to 12-inch Des Moines, Wash., has $46,000 available for improvements, Waitsburg, Wash., plans a $81,000 project. Albion, Wash., has awarded the contract for a $11,818 extension. Lewis & Clark district, Astoria, Oreg., plans a $90,000 project and Wickiup, Oreg., has voted $35,000 to improve water system.

Cast Pipe Placed

300 tons, 20-inch, Greenfield, Mass., to R. D. Wood & Co., Florence, N. J.
250 tons, 16-inch, Salem, Mass., to R. D. Wood & Co., Florence, N. J.

Cast Pipe Pending

641 tons, 8 to 16-inch, Class 150, East Bay municipal utility district, Oakland, Calif.; bids opened.
342 tons, 18-inch, Class 150 or steel pipe, Pittsburg, Calif.; bids opened.
100 tons, 8-inch, Seattle; bids Oct. 20.
Unstated tonnage, waterworks improvements, Kenosha, Wis.; PWA grant of $424,636 allotted.
Unstated tonnage, waterworks improvements, Racine, Wis.; PWA grant of $258,000 alloted.

Steel Pipe Placed

200 tons, 42-inch, west approach to Main street bridge, Cleveland, to Bethlehem Steel Co., Bethlehem, Pa.; through National Engineering Co., Cleveland.

Semifinished

Semifinished Prices, Page 79

Pittsburgh—Semifinished steel orders increased slightly the past week as nonintegrated mills increased consumption. Weaker prices

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Manganese and Alloy Steel Castings One Half to One Thousand Pounds Produced in our modernly equipped foundry from electric furnace steel and heat-treated in automatically controlled gas-fired furnaces.

DAMASCUS STEEL CASTING CO.
New Brighton, Pa.
(Pittsburgh District)

Behind the Scenes with STEEL

Back To Work We Go

■ Everywhere you go, business is definitely better. Now that we aren't keeping our ears pinned to the loudspeaker to see what our foreign friends are screaming to the world, maybe we can put a little of our nervous energy to work on some of our own problems. Steel and automobile production schedules are moving up—stocks are touching new highs for the year and last week more new subscribers added STEEL to their essential reading than any time for months. We should move into 1939 with a smooth shift into high gear and an overdrive to eliminate too much grunting and groaning. If we don't try to "step on it" too hard or have an overdose of back seat driving, we can all have a swell ride.

Not Far Wrong

■ In Cleveland a couple of weeks ago Republic Steel's T. M. Girdler told about his being introduced to a group of club women recently, one of whom gushed enthusiastically, "Oh, so you're the Tom *Merger* Girdler I've seen mentioned in the papers so often".

Dry (Ice) Humor

■ Last week C. E. "Elmer" Gischel of Walter Kidde & Co. dropped in to say hello. We were glad to see him but we're still smarting from being on the receiving end of Elmer's pet practical joke. Walter Kidde, you know, makes fire extinguishers which use liquid carbon dioxide as the extinguishing medium. We expressed some curiosity on how the thing worked and our pal gleefully demonstrated by squirting it right smack into our new $5 Stetson which he then plunks down on our head. Well, this stuff turns itself into dry ice after it is released and our poor knob is still about 25 degrees colder than the rest of our ailing body. We think we'll get one of those things and have it handy whenever we want to cool off some of these more enthusiastic salesmen who get all het up when we don't gobble up their wares.

Nazi Note

■ From Melvin E. Holtz out in Elgin, Ill., comes the pun of the week, or a weak pun—take your choice. Being a close reader of the advertising pages, Mr. H. reminds us that a Chicago steel company sells what they call "Certified Steel" (see page 14) but he insists that one steel they can't certify is Herr Hitler's steal of Czechoslovakia.

Shoot the Buck

■ One of our more naive friends came back from a convention a few days ago and started to explain a new game they played the night of the big banquet. It seems the game is called "Ah Nertz" and is played with two little cubes which one fellow rolls out on the floor. Everytime the numbers add up to 7 or 11 on the first roll, everyone else in the game says, "Ah Nertz".

Don't Forget

■ And once again we want to suggest you get over to Booth A-203 at the Metal Show this week. Of course there are a lot of other interesting exhibits at the show but for your own sake don't miss us. You see, STEEL's booth is strategically located right next door to the Men's Room so you'll have to drop by sooner or later.

In the Yawning

■ Have you ever been a father? If you have we needn't say more, but if you are innocently ignorant of those sunrise sessions when the bottle warmer goes on the blink and the safety pins poke your fingers full of holes then you probably won't appreciate how we long for that glorious extra hour of snoozing or why we're fast becoming just a shell of our former robust self.

—Shrdlu

have been reported in some products, notably sheet bars, which have been influenced by the recent cut in flat-rolled steel. Production of wire rods and skelp has been speeded by increased activity in pipe and wire markets, although billets and sheet bars account for most of the upturn in semifinished demand.

Wire

Wire Prices, Page 79

Pittsburgh — Manufacturers' wire prices appear to be holding in the face of weakness in other steel products. Easiness in various merchant wire products in some sections is reported to be spreading. Orders for manufacturers' wire are slightly heavier, with automotive demand predominating. Business elsewhere is well diversified.

Cleveland — Demand for manufacturers' wire continues to gain, reflecting increased activity among auto suppliers here. Specifications for merchant items have also shown a moderate increase recently. Jobbers' inventories are still relatively low.

Chicago—Wire demand continues to gain slowly, with automotive needs heavier and miscellaneous demand still rising. Some hesitation is looked for, however, as a consequence of the recent break in flat-rolled steel prices. While most wire users do not expect a cut in prices, they are anxious to be protected in the event of reduction and are expected to be cautious in purchases until the situation clears.

Boston—Influenced by the reduction in several flat-rolled steel products, buyers of wire in some instances are hesitating over the possible effect on round and other wire products. While there has been some scattered shading on wire, the price as a whole has been well maintained and in no way compares with the weakness in cold strip which has prevailed for some weeks. Nails, as usual, have displayed less resistance to pressure for lower quotations, although buyers have not as a rule exerted much pressure for concessions.

New York — Better orders for spring wire are appearing from the automobile industry, which coupled with sustained demand by furniture builders, makes this item one of the most active in the wire trade. Thus far no open breaks are noted in wire prices, uncertainty has developed as a result of the decline in strip and other flat-rolled steels. Volume is running well ahead of last month with most producers, 20 per cent in some instances.

Birmingham, Ala. — Wire output has shown some decline each week

for some time, with the result that demand is described currently as hardly better than fair. Production is slightly below 50 per cent of accepted normal.

Rails, Cars

Track Material Prices, Page 79

Due to the recent reduction in sheet and strip prices, the New York Central has asked for new bids on its routine fourth quarter requirements of sheets, strip, plates, shapes, bars and other miscellaneous items. Original bids were opened Oct. 8, but no action had been taken.

Car inquiry is featured by a list of 46 freight cars for the navy, on which bids will be opened Nov. 1.

Southern Railway opened bids Oct. 12 on 1000 high-side gondolas, 1300 steel box cars and 100 stock cars. Specifications are similar to corresponding types placed in May and bids were obtained on short notice.

Union Pacific has issued an inquiry for a maximum of 30 locomotives, asking bids also on smaller numbers.

Immediate production is being started on New York Central's rails as it is desired to lay some before winter. A railroad in the South has expressed willingness to buy its rail requirements earlier than usual to give winter employment to workers and this may bring out some late tonnage.

Car Orders Pending

Navy, 39 50-ton flat cars, four 50-ton box cars and three 60-ton narrow gage flat cars, bids Nov. 1; the three narrow gage cars are for Hawaii, while the remaining 43 are for various yards in this country.

Southern Railway, 1000 high-side gondolas, 1300 steel box cars and 100 stock cars; bids opened Oct. 12.

Locomotives Pending

Union Pacific, 30 locomotives; bids asked also on alternates for smaller numbers.

Tin Plate

Tin Plate Prices, Page 78

Pittsburgh—National production of tin plate holds around 30 per cent, with little prospect of an early upturn. Price uncertainty has been intensified by weakness in sheets and strip, and new orders are scant. With the packing season over, activity in sanitary cans is light, although a slight increase in general line can business has taken up part of the slack. Low inventories of tin plate consumers enhance prospects for future demand, the direct opposite of the situation a year ago when the carryover of stocks was heavy.

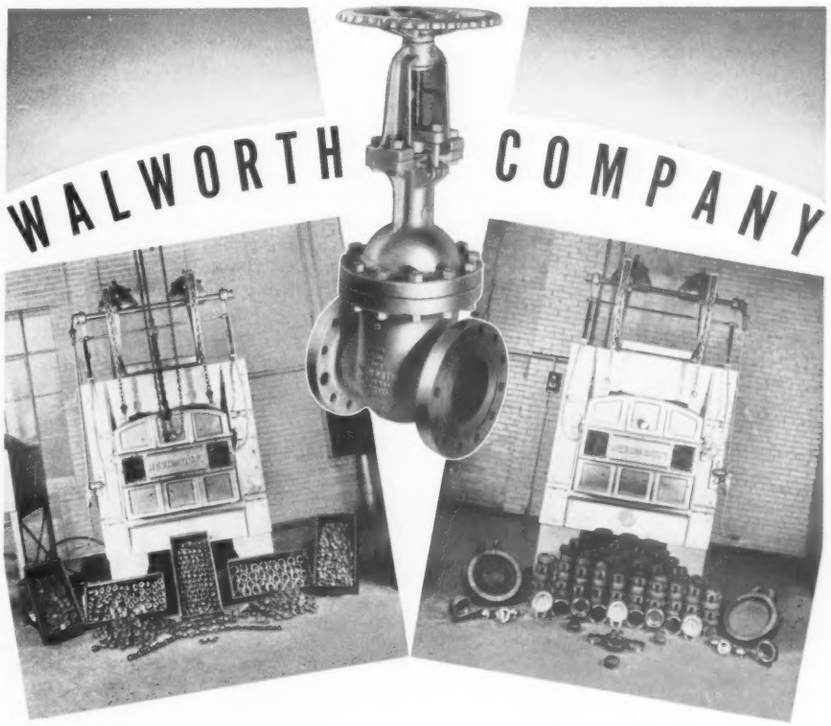
Chicago—Tin plate bookings and production continue slow. Some tin mills are down, while others are on curtailed schedules. The fact that consumers are cutting substantially into inventories offers the principal hope for a pickup in tin plate buying in the near future.

New York—While tin plate is unchanged at $5.35, Pittsburgh-Gary, the recent decline in sheet and strip prices, has served to dry up tin plate buying. Consumers see possibility of an early reduction in tin plate prices and are interested in holding down stocks.

Shapes

Structural Shape Prices, Page 78

New York — Structural contracts are the lowest in several weeks with active tonnage estimated and up for bids under 15,000 tons.



HD-243618-C Controlled Atmosphere Furnaces at the Walworth Company, Greensburg, Pa. These furnaces are used for hardening forged and cast valve parts of special chrome steels.

and

HEVI DUTY FURNACES

In the manufacture of fine valves, such as Walworth's, heat treating of the various parts is of the utmost importance. The use of Hevi Duty Controlled Atmosphere Furnaces by the Walworth Company, for heat treating their cast and forged valve parts, has enabled them to meet accurate hardening specifications and materially reduce heat treating costs.

HEVI DUTY ELECTRIC COMPANY

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MILWAUKEE, WISCONSIN

Bridges in New York state and New Jersey approximate 3000 tons, including 1200 tons for repairs to the Williamsburg span, New York. Practically all structural needs are for public work and fabricated structural prices continue weak.

Pittsburgh—Fabricated shape inquiries are more active, headed by 7000 tons for a mill building for Youngstown Sheet & Tube Co., Indiana Harbor, Ind., and 3500 tons for a Rock Island railroad bridge, Arkalon, Kans. Awards are lighter, outstanding being 750 tons for a navy shop, Bremerton, Wash., and 650 tons for a Montgomery Ward & Co. store, Detroit.

Cleveland—Public work continues to dominate the structural market, although a slight improvement in inquiries from private sources has developed recently. Awards include 200 tons for a factory building for Weldrods Inc., Cleveland, to Patterson-Leitch Co., Cleveland, and 315 tons for a state bridge at Dover, O., to Burger Iron Works, Akron, O. Republic Structural Iron Works, Cleveland, is low on 1000 tons of bearing piles for a government project, Gordon park, Cleveland, and National Engineering Co., Cleveland, is low on 400 tons for the East Ninth street bridge, Cleveland. Youngstown Sheet & Tube Co., Youngstown, O., is expected to place approximately 7000 tons of structurals of improvements at its Indiana Harbor, Ind., plant. Continued weakness is noted in prices for both plain and fabricated material.

Chicago — Structural demand is being maintained largely by small orders, with only a few large lots pending. Projects financed wholly or in part by federal funds are bolstering activity, although private needs also are increasing.

Boston—Bridge requirements are heavier, approximating 1500 tons, with bids in on a 600-ton structure, two 184-foot truss spans, Westfield, Mass., and closing Oct. 19 on a 414-ton bridge, Farmington, Me. The remainder are made up of beam and stringer spans, inquiries being out for Maine, Massachusetts and Vermont. Building construction develops slowly with most inquiries for public work. Two district fabricating shops have slightly better backlogs, but fabricated and erected prices are still weak. Plain material, however, is reported holding to listed quotations.

Buffalo — Inquiries appear more numerous but not all fabricators are sharing in the improvement. The bidding date is awaited on the new $2,700,000 convention hall here. The $1,400,000 Kleinhans music hall also is due to be up soon. R. C. McManus, Buffalo, has been awarded 500 tons for the Spencer Lens Co.'s building, Buffalo.

Philadelphia — Several large structural jobs are active. Bids go in Nov. 9 for the Philadelphia municipal court building, requiring approximately 1000 tons.

George Hyman Construction Co., Washington, is low bidder on a municipal court building for that city requiring 835 tons of shapes. Bids will go in Oct. 24 on the Allegheny avenue grade elimination job, which will require about 1200 tons of shapes. Shape prices are none too strong both as regards erected quotations and mill bases, according to fabricators.

Birmingham, Ala. — Structural shapes have been unusually active in the past few days and considerable tonnage has been booked. As is the case with most other finished products, the business is widely scattered and for the most part in relatively small orders.

Seattle — No important projects are up for figures, but business pending and recently placed is the largest of the year. Awards included 720 tons for smith and pipe shop, Puget Sound navy yard, to Columbia Steel Co. and 500 tons steel sheet piling for the cofferdam navy yard graving dock construction to Bethlehem Steel Co., Seattle. Largest job pending is the Narrows bridge at Tacoma, involving more than 15,000 tons.

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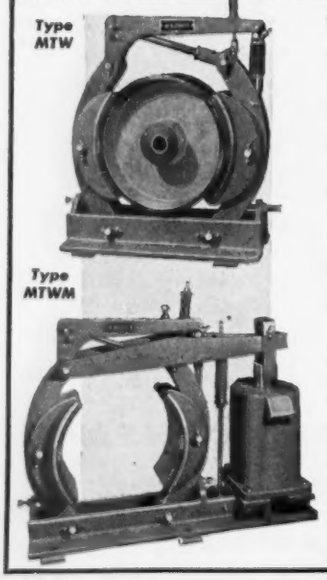

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Shape Contracts Placed

1300 tons, machine shop, building 16, navy yard, Philadelphia, to American Bridge Co., Pittsburgh, through Ralph S. Herzog, Philadelphia.

720 tons, smith and pipe shop, Puget Sound navy yard, to Columbia Steel Co., Seattle.

700 tons, Calvin Coolidge high school, Washington, to Fort Pitt Bridge

Shape Awards Compared

	Tons
Week ended Oct. 15	10,294
Week ended Oct. 8	13,202
Week ended Oct. 1	50,088
This week, 1937	32,454
Weekly average, year, 1937	23,251
Weekly average, 1938	19,351
Weekly average, September	36,500
Total to date, 1937	1,036,868
Total to date, 1938	812,732

Includes awards of 100 tons or more.

Works, Pittsburgh, through Jeffress Dyer Inc., Washington.
650 tons, crane runway, Brooklyn navy yard, to American Bridge Co., Pittsburgh.
575 tons, bridge FAP-117-C, Denton county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.
510 tons, additions, structural and machine shops, navy yard, Charleston, S. C., to Virginia Bridge Co., Roanoke, Va.; yards and docks spec. 8853.
500 tons, building, Spencer Lens Co., Buffalo, to R. C. McManus Co., Buffalo.
500 tons, steel sheet piling, coffer dam Puget Sound navy yard graving dock, to Bethlehem Steel Co., Seattle.
315 tons, bridge, Dover, O., to Burger Iron Works, Akron, O.; through Wendling Bros., Dover.
315 tons, 23,700 feet curb angles, department of purchase, New York city, to American Bridge Co., Pittsburgh.
270 tons, addition, telephone building, New York, to Bethlehem Fabricators Inc., Bethlehem, Pa.
255 tons, state highway bridge FAS-29, Maury county, Tennessee, to Decatur Iron & Steel Co., Decatur, Ala.
250 tons, health and recreation building, Springfield, Mo., to International Steel Co., Evansville, Ind.
240 tons, state bridge SS. 38-29, Goshen-Michigan Corners, Orange county, New York, to American Bridge Co., Pittsburgh; John Arborio, Inc., Poughkeepsie, N. Y., general contractor, $59,583.80, bids Sept. 27, Albany.
235 tons, addition, women's hospital, Baltimore, Md., to Dietrich Bros., Baltimore.
215 tons, 67 transmission towers, Central New York Power Corp., Emeryville, N. Y., to Lackawanna Steel Construction Co., Buffalo.
210 tons, American Radiator building, world's fair, New York, to Lehigh Structural Steel Co., Allentown, Pa.
209 tons, structural steel framing, Leavenworth fish hatchery, Columbia basin project, Washington, to American Bridge Co., Pittsburgh, $12,426, f.o.b. point Chicago, spec. 1115-D, bids Sept. 15.
200 tons, factory building, Weldrods Inc., Cleveland, to Patterson-Leitch Co., Cleveland.
165 tons, bridge No. 5592, Duluth, Minn., to American Bridge Co., Pittsburgh.
160 tons, state bridge WPGH-80, Ida Grove, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
150 tons, bridges and repairs, Hastings, Minn., and Terre Haute, Ind., Chicago, Milwaukee, St. Paul & Pacific railway, to American Bridge Co., Pittsburgh.
140 tons, grade school, Manhasset, N. Y., to Dreier Structural Steel Co., New York.
140 tons, garage, U. S. army, Scott Field, Ill., to Stupp Bros. Bridge & Iron Co., St. Louis.
135 tons, police station, Corona, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.
130 tons, state bridge T-120, Anthon, Iowa, to Pittsburgh-Des Moines Steel Co., Pittsburgh.
125 tons, state bridge SS. 38-30, Chemung county, New York, to American Bridge Co., Pittsburgh; E. V. Chappell, Binghamton, N. Y., $57,334, bids Sept. 27, Albany.
120 tons, grain elevator, Winona, Minn., to Gage Structural Steel Co., Chicago.
120 tons, bridge 88.13, Curzons, Mo., Chicago, Burlington & Quincy railroad, to Joseph T. Ryerson & Son Inc., Chicago.
115 tons, Sullivan estate building, Elmira, N. Y., to American Bridge Co., Pittsburgh.
110 tons, high school, Portage, Wis., to C. Hennecke Co., Milwaukee.
110 tons, power house, Providence, R. I., to Providence Iron & Steel Co., Providence, R. I.; Tredinnick-Billings Co., Boston, general contractor.
105 tons, state bridge RC-3987, Chautauqua county, New York, to Lackawanna Steel Construction Co., Buffalo; Peter J. Knickenberg, Buffalo, general contractor, $294,877.45, bids Sept. 27, Albany. Contract also includes highway section taking 225 tons of mesh.
100 tons, St. Joseph's school, Garden City, N. Y., to Belmont Iron Works, Eddystone, Pa.
100 tons, structural steel supports for Cheyenne and Greeley substations, Kendrick project, Wyoming, to Worden-Allen Co., Milwaukee; bids Sept. 23, spec. 1121-D, bureau of reclamation, Denver, awarded Oct. 6.
100 tons, high school, Wellington, O., to Fort Pitt Bridge Works, Pittsburgh.
Unstated, 6-span 245 foot overpass, Meagher county, Montana, to unnamed interest.
Unstated, plate girder underpass, Laurel county, Montana, to unnamed interest; W. P. Roscoe, Billings, general contractor.

Shape Contracts Pending

7000 tons, strip mill group and open hearth extension, Youngstown Sheet & Tube Co., Indiana Harbor, Ind.
3500 tons, bridge over Cimarron river, Arkalon, Kans., Chicago, Rock Island & Pacific railroad.
2556 tons, sheet piling, United States engineer office, San Francisco, for delivery at Welles Harbor, Midway Island; bids Oct. 20.
1500 tons, foundry building, United States bureau of yards, Mare Island, Calif.
1200 tons, repairs, Williamsburg bridge, New York.
1200 tons, grade crossing, Allegheny avenue, Philadelphia, bids Oct. 24.
1000 tons, bearing piles, government project, Gordon park, Cleveland; Republic Structural Iron Works, Cleveland, low.
1000 tons, municipal court building, Nineteenth and Vine, Philadelphia, bids Nov. 9.
835 tons, municipal court building, Washington, Hyman Construction Co., Washington, low.
750 tons, state office building, Sacramento, Calif.; bids soon.
600 tons, Briarwood apartments, Kew Gardens, New York.
600 tons, bridge, Chicopee Falls, Mass., flood replacement; T. Stuart & Son Co., Watertown, Mass., general contractors.
600 tons, bridge, two 184-foot truss spans, Westfield, Mass.; Daniel O'Connell's Sons Co. Inc., Holyoke, Mass., general contractors.
526 tons, hangar, eleventh naval district, San Clement, Calif.
450 tons, Provident building, Charleston, W. Va.
414 tons, Center bridge, sandy river, Farmington, Franklin county, Maine, federal aid project 96-C; bids Oct. 19, state highway commission, Augusta, Max Wilder, bridge engineer.
400 tons, bridge, Detroit, for Wayne county, Michigan.
400 tons, bridge, Alpena, Mich.
400 tons, east ninth street bridge, Cleveland; National Engineering Co., Cleveland, low.

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Convenience that saves time and taxi fare. Hotel Cleveland adjoins the Union Terminal and Terminal group, and is at the very heart of Cleveland, Ohio.

HOTEL CLEVELAND *Cleveland*

315 tons, state bridges, Steuben county, New York.
275 tons, structural tunnel supports, Salt Lake aqueduct, Provo river project, Utah; bids Oct. 27, to bureau of reclamation, Provo, Utah.
270 tons, state highway bridge 5860, Minneapolis.
235 tons, bridge, Tonnelle avenue, Jersey City, N. J.; bids Oct. 29.
270 tons, building E, Bridgeport Brass Co., Bridgeport, Conn.
225 tons, gymnasium, Hamilton college, Clinton, N. Y.
225 tons, tunnel supports, Provo river project, specification 808, Utah; bids Oct. 27.
225 tons, high school, Coatesville, Pa., John McShain Inc., Philadelphia, low.
215 tons, state bridge 5506, Millville, Minn.
215 tons, plate girder bridge, FAGS-1-A (1) Sturtevant, Wis.; Ferd J. Roberts, Burlington, Wis., low.
210 tons, high school, Monroe, Wis.
200 tons, addition to Holmes school, board of education, Pittsburgh.
200 tons, school, Abbington, Mass.
200 tons, new jail, Chautauqua county, New York; bids Oct. 31.
200 tons, bridges, Louisville & Nashville railroad, Louisville division.
200 tons, three span beam bridge, Lemon Fair river, Shoreham, Vt.; bids Oct. 21 to H. E. Sargent, commissioner of highways, Montpelier.
180 tons, state highway maintenance building, Bradford county, Pennsylvania.
180 tons, building for boys' club, Detroit.
175 tons, Dunn county, Wisconsin, federal aid project 475 D; Wisconsin Bridge & Iron Co., Milwaukee, low bidder.
160 tons, galvanized, Guntersville dam switchyard; bids Oct. 26 to Tennessee valley authority, Knoxville, Tenn.
125 tons, bridge, Cambridge, Md., state highway department; bids Oct. 17.
125 tons, addition to state hospital, Alpena, Mich.
124 tons, 88-foot plate girder bridge, Bradford, Vt., and 84-foot I-beam span, Thetford, Vt., O. W. Miller Co. Inc., Ludlow, Mass., and Lockwood-Young Corp., Concord, N. H., general contractors respectively, bids Oct. 7.
110 tons, two 84-foot I-beam spans and approaches, West Windsor and Chelsea, Vt.; bids Oct. 21, H. E. Sargent, commissioner of highways, Montpelier.
105 tons, city hall, Gardner, Mass.; Swanburg Construction Co., Manchester, N. H., general contractor.
100 tons, high school, Pepperell, Mass.
100 tons, grade school, Pottstown, Pa.; bids Oct. 17.
100 tons, buildings, Delaware university, Newark, Del., bids Oct. 25.

Reinforcing

Reinforcing Bar Prices, Page 79

New York — Reinforcing steel buying has slackened, with new tonnage coming out less actively. Contracts include several hundred tons of highway mesh, but part of the 1500 tons now active for New York state work may not be bought until next spring. The number of small-lot orders is substantial, but prices are sagging. Bids on the Queensbridge housing project, 5000 tons, were postponed to Oct. 21.

Pittsburgh—Prices are weak on larger projects, but a firmer tendency is noted on smaller jobs. Business is fairly active although yet to reach a volume that will strengthen the market. Largest of recent orders is 1400 tons for an Eastman Kodak Co. building, Rochester, N. Y. For a sewer here, 500 tons has been placed. New inquiries generally are small, one exception being 575 tons for a St. Joseph, Mo., postoffice.

Cleveland—Demand for reinforcing steel bars has not brought gains predicted a month ago. There is a fair demand for joists for a number of school projects. Private work is negligible and little improvement is expected through the remainder of this month. Fabricated prices continue weak.

Chicago — Reinforcing concrete bar interests here are more active as a large number of small projects are on the market. This heavy influx of small projects continues to give evidence of private construction, although numerous schools and government-financed jobs are involved also.

Boston — Reinforcing steel inquiries are more numerous and close to 1500 tons are active. The largest is for a sewer, Medford, Mass., closing Oct. 20 with the Metropolitan district commission, Boston. Small lots for bridges are coming out briskly, but public work accounts for practically all buying. Prices are weak.

Philadelphia — Reinforcing bar fabricators report considerably more small jobs involving less than 100 tons individually are beginning to make their appearance. These all PWA financed work, with private construction practically at a standstill. Financial details have finally been arranged for the Pennsylvania turnpike from Harrisburg to Pittsburgh and bids will be advertised immediately for the first contract job.

Buffalo — Inquiries are increasing with activity at a peak so far this year. Bethlehem Steel Co. has booked 760 tons for the Buffalo

Concrete Bars Compared

	Tons
Week ended Oct. 15	**9,270**
Week ended Oct. 8	**4,814**
Week ended Oct. 1	**9,106**
This week, 1937	**8,958**
Weekly average, 1938	**6,509**
Weekly average, year, 1937	**6,061**
Weekly average, September	**10,950**
Total to date, 1937	**266,403**
Total to date, 1938	**273,366**

Includes awards of 100 tons or more.

Lakeview housing project. Tomack Builders Inc., Rochester, was low bidder on the general contract for the Lexington avenue sewer project, that city, calling for 300 tons of reinforcing and 480 tons of tunnel liners.

San Francisco—Reinforcing bar awards of 2632 tons are headed by 1450 tons for the Lake street tunnel here and 565 tons for Los Angeles, under specification 2713. Outstanding inquiries include 2500 tons for a Seattle, Wash., bridge and 600 tons for a state building, Sacramento, Calif. Awards to date of 110,594 tons compare with 80,796 in the corresponding 1937 period.

Reinforcing Steel Awards

1800 tons, apartment, Riverside drive, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Walter Kidde Constructors, Inc., New York, general contractor.

1450 tons, Lake street tunnel, San Francisco, to Ceco Steel Products Corp., San Francisco.

1400 tons, building, Eastman Kodak Co., Rochester, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.

960 tons, Lakeview housing project, Buffalo, to Bethlehem Steel Co., Bethlehem, Pa.; includes 200 tons of joists.

565 tons, water and power department, Los Angeles, specification 2713, to Columbia Steel Co., San Francisco.

550 tons, 750-man barracks, Fort Benning, Ga., to Bethlehem Steel Co., Bethlehem, Pa.; Beers Construction Co., Atlanta, general contractor.

500 tons, sewer, Thirty-third street, Pittsburgh, to Fort Pitt Bridge Works, Pittsburgh.

406 tons, project ER-45-A, Pickaway county, Circleville, O., to Bethlehem Steel Co., Bethlehem, Pa.; Lewis & Frisinger, Ann Arbor, Mich., contractor.

350 tons, barracks, Ft. Sheridan, Ill., to Concrete Steel Co., New York; Thorp-Rogoff, contractors.

280 tons, building, Froedert Grains & Malting Co., Milwaukee, to Inland Steel Co., Chicago; through J. S. Metcalf Co., contractor.

225 tons, mesh, highway 3987, Chautauqua county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; Peter J. Kickenberg, Buffalo, N. Y., general contractor.

180 tons, school building, Everett, Wash.; to Seattle Steel Co., Seattle.

150 tons, bridge, Hillsdale avenue, Fairfield, Conn., to Truscon Steel Co., Youngstown, O.; D. Deering & Son, Norwalk, Conn., contractor.

150 tons, barracks, Fort Niagara, N. Y., to Bethlehem Steel Co., Bethlehem, Pa.; Ross Engineering Co., Washington, general contractor.

110 tons, mesh, highway RC-3985, Melrose-Schaghticoke Hill, Rensselaer county, New York, to American Steel & Wire Co., New York; Sheehan Contracting Co., Albany, N. Y., general contractor, $139,257.50; bids Sept. 7, Albany.

100 tons, power house, Providence, R. I., to Bethlehem Steel Co., Bethlehem, Pa.

100 tons, Ferry street bridge, New Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; C. W. Blakeslee & Son, New Haven, Conn., general contractor.

Reinforcing Steel Pending

2500 tons, Ballard bridge approaches, Seattle; bids in December.

2200 tons, Puget Sound yard graving dock; General Construction Co., Seattle, general contractor.

750 tons, two barracks, Fort Lewis, Wash.; George A. Fuller Co., Los Angeles, general contractor.

600 tons, state office building, Sacramento, Calif.; bids soon.

500 tons, United States engineer office, proposal 170, Los Angeles; Bethlehem Steel Co., Los Angeles, low.

575 tons, post office, St. Joseph, Mo.

390 tons, cold storage research laboratory, Beltsville, Md.

300 tons, Lexington avenue sewer project, Rochester, N. Y., Tomack Builders Inc., Rochester, low.

225 tons, municipal court building, Washington.

218 tons, reconstruct Santa Clara river bridge, Los Angeles county, California; bids Oct. 27.

205 tons, two bridges, Santa Clara county, California, for state; bids Oct. 26.

200 tons, high school, Coatesville, Pa.; John McShain Inc., Philadelphia, low.

200 tons, nurses' home, Madison, Wis.

165 tons, highway project, Blue Ridge parkway, Carroll and Grayson counties, Virginia; bids No. 3 to bureau of public roads, department of agriculture, Washington.

165 tons, grade crossing, West Shore railroad, Bogota, N. J.

150 tons, penitentiary, Leavenworth, Kans.

150 tons, surge basin, Detroit.

100 tons, Central state hospital, Indianapolis, Ind.

100 tons, Terrace Heights bridge, Yakima county, Washington; Fioroto Bros., Seattle, low on span; H. J. Adler, Yakima, low on approaches.

100 tons, deformed, round and square, U. S. engineer, Huntington, W. Va.; bids Oct. 21, proposal 82.

100 tons, buildings, Delaware university, Newark, Del.; bids Oct. 25.

Pig Iron

Pig Iron Prices, Page 80

Pittsburgh—Demand has slowed down lately, but the condition is regarded as only temporary, being due to the irregularity in calls from foundries. The market is nominal at the recently advanced price and is expected to remain so until at least the end of the year unless a heavier demand appears in the meantime.

Cleveland—Pig iron producers report shipments so far this month are approximately 20 per cent above the comparable period during September and still further gains are expected through the remainder of the month. Reflecting this condition foundry coke shipments have also increased substantially. Releases from automotive foundries have aided. Improvement is also noted among jobbing and heating equipment foundries. A few export inquiries have found their way here from the eastern seaboard, but no exceptional large tonnages have been reported. Prices are firm.

Chicago—October may set a new

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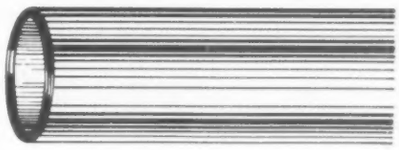

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CLEVELAND, OHIO

ORDER FROM STOCK

peak for the year in pig iron shipments, it is indicated by results for the month to date. Since the buying flurry prior to the recent price advance, sales have been scant. Before the increase became effective, many contracts for fourth quarter were expanded to include additional tonnage at the old price, with the result that sellers are expected to realize little of the extra $1 benefit until next quarter.

New York—While there has been some miscellaneous carlot buying at the higher prices, the pig iron market is quiet as most buyers covered on their requirements late last month before the new prices became effective. Shipments continue about on a parity with the first half of September. Export inquiry includes approximately 10,000 tons of basic for European destination. However, as European prices have dropped sharply over the past week or 10 days, it appears domestic sellers will find it difficult to compete.

Philadelphia — Pig iron shipments continue to improve moderately. Stove foundries are fairly well occupied, and jobbing plants report an encouraging gain in new business and inquiries. A district interest may blow in a second blast furnace soon, it is reported, following the lighting of a second stack a few weeks ago. Sale of 10,000 tons of pig iron to Italy is reported along with 20,000 tons to Poland.

Buffalo—Pig iron producers are encouraged by the sustained pickup in shipments, with expectations that the October movement will top that of September, the best month of the year to date. Activity of local foundries has improved less than that of mid-state and eastern plants.

Cincinnati—Pig iron movement is holding at the improved level of September, with requirements of heating equipment manufacturers being most pronounced. Operations of jobbing foundries are slow to increase.

Toronto, Ont.—Pig iron consumption is picking up slowly, with a gain of about 10 per cent shown over the summer low. Sales were retarded slightly the past week by the Monday holiday, but melters are taking delivery against contracts.

Scrap

Scrap Prices, Page 82

Pittsburgh — Scrap prices are fairly firm in the face of light demand. Most mills here are taking shipments on old orders as well as some small lots of new business, with the bulk of No. 1 heavy melting steel going at $15. Some premium grades have sold at $15.50. Down-river scrap buyers are offering $15 for No. 1 steel for resale. Cast grades are in light demand. General strength of the market was reflectetd in the recent Pennsylvania railroad list which brought about $16 for heavy melting steel, the equivalent of former prices.

Cleveland—Scrap trading is limited to usual routine shipments on contracts. Most scrap on recent railroad lists went to coast ports for export at around $15 per ton, or slightly higher. Some steelmakers are exchanging scrap within their own organizations, accounting for movements not involved in sales. Quotations are unchanged.

Chicago — The scrap market is unusually quiet with trading at a low point and few sources anticipating early activity. No. 1 heavy melting steel is still being quoted at $12.50 to $13 as the last mill sale over a week ago is reported to have brought $13. Brokers are believed paying close to $13 now for No. 1 grade, although some steel is said to be available at $12.50, providing, of course, that shipment can be taken.

Boston—While boat-loading is less active, brokers continue to buy heavy melting steel for export, material coming out rather sluggishly with $13 bid, dock, for No. 1 and one broker offering slightly better for tonnage. Movement of cast grades to Pennsylvania is heavier with prices on No. 1 machinery, No. 2 cast and textile cast higher by 50 cents a ton in some instances.

New York—Price weakness in finished steel has depressed scrap trading, although quotations are unchanged for both domestic and export shipment. Several mills have held up shipments while others in the East are buying hand-to-mouth and are taking scrap direct from cars to open-hearths. Foundry grades are steady, but buying is limited largely to current requirements.

Philadelphia—Scrap prices continue strong, due to continued buying for export. A boatload cleared recently for Europe, having been purchased at $13, Port Richmond, for No. 2 and $14 for No. 1. Negotiations are reported under way for 400,000 tons of No. 1 and No. 2 scrap to European consumers, with $16 and $14.50, respectively, believed to be asked. In the domestic market, No. 1 continues $14.50 to $15. Heavy breakable cast is firm on business at $16.50.

Buffalo—Recent dullness has been broken by a sale of 1000 tons of No. 1 heavy melting steel to a local consumer within the price range of $14 to $14.50, unchanged from the last sale. Substantial scrap reserve in the hands of one large steelworks still tends to restrict mill buying.

Detroit — Sentimental weakness, the result of weakness in flat-rolled steel prices, is evident in scrap here. While no price changes have been made as yet, some dealers anticipate reductions after Hudson and Fisher lists close this week. Anticipated increase in size of these lists is

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a further reason for expecting lower prices.

Cincinnati—Scrap prices are holding as dealers await expansion in consumer demand. Mills are taking sheet clippings, No. 2 steel and other grades, but a large part of requirements is coming from inventories. Foundry needs are spotty and light. Dealer trade is restricted by desire to avoid increasing yard stocks.

Birmingham, Ala.—Because some business has been forthcoming over the past few days from Republic Steel Corp., the district's largest buyer, a somewhat more optimistic tone has developed in the scrap market.

Seattle — Release of credits has stimulated the movement of scrap in fairly large tonnages to Japan, several vessels having been chartered for this business at freights ranging from $3.45 to $3.65, free loading and discharge.

Toronto, Ont.—Scrap trading is gaining steadily, and while consumers are interested chiefly in special grades, such as heavy melting steel and machinery cast, a few other items are becoming more active, particularly wrought scrap. Dealers await demand from the United States to absorb surpluses of material for which there is little domestic call. Prices are steady, with indications of an early advance in some grades.

Warehouse

Warehouse Prices, Page 81

Cleveland — Shipments have declined further. Orders are slightly more numerous, but tonnages are disappointing. Recent reductions in mill prices on sheets and strip are not expected to affect warehouse quotations immediately.

Chicago — Sales have improved further, with indications pointing to a new peak for the year in October. Jobbers report demand is widely diversified, practically all products sharing equally in activity.

New York—Warehouses in some instances have noted gains in volume with current totals close to 10 per cent ahead of last month. Orders are numerous, but small and widely diversified. Prices are unchanged, but shading prevails on some products, including sheets, nails and pipe.

Philadelphia — Steel sales out of warehouse are a shade better although the reduction in sheet prices has resulted in increased uncertainty. Up to the time of the mill reduction, warehouse prices had been tending to stiffen slightly. At the moment specialty items are moving better than standard materials.

Buffalo — Business appears to have leveled off around the September volume, best for the year to date. Orders are well diversified, although heavy products are slow. Whether or not sheet prices will be reduced to meet the mill cuts remains to be determined.

Cincinnati—Sheet and strip prices are being continued despite the recent reductions in mill quotations. Volume is holding closely to September levels, showing little effect from price unsettlement. A bulge in sales of building material has faded.

St. Louis—Galvanized sheets are in best demand out of warehouse here, although total business the first half of this month was about equal to that of the corresponding September period.

Seattle — Warehouse volume improved this week but the month's total is below the corresponding period in September. Light plates, hot-rolled and galvanized sheets continue to lead. Prices are firm and generally maintained but in Portland territory some dealers are reported to be underselling.

Steel in Europe

Foreign Steel Prices, Page 81

London—(*By Cable*)—Steel production in Great Britain in September totaled 754,700 gross tons, a gain of 95,800 tons over the 658,900 tons made in August. This compares with 1,163,000 tons in September, 1937, which is the all-time high. Pig iron output in September was 429,800 gross tons, compared with 443,000 tons in August, a loss of 13,200 tons. In September, 1937, pig iron production was 714,000 tons. Active stacks at the end of September numbered 77, compared with 81 at the end of August.

Iron and steel trading in Great Britain continues restricted, most plants being operated well below capacity. Gradual reduction in stocks and slight expansion of inquiry are hopeful signs. The recent war scare stimulated demand for galvanized sheets and light sections, but the heavy industry, especially shipbuilding, is in need of orders. Export trade is slightly improved.

The Continent reports stronger markets, particularly in Scandinavia and the Argentine.

Ferroalloys

Ferroalloy Prices, Page 80

New York—Reflecting further increases in ingot production, ferromanganese shipments continue to expand. Sellers are confident that the October movements will represent an improvement for the fourth consecutive month. Meanwhile, the market is unchanged at $92.50, duty paid, Atlantic and Gulf ports.

Domestic spiegeleisen, 19 to 21 per cent, is holding at $28, Palmerton, and 26 to 28 per cent, at $33. Spiegeleisen shipments, likewise, re-

THE HANNA FURNACE CORPORATION
MERCHANT PIG IRON DIVISION OF NATIONAL STEEL CORPORATION
Buffalo Detroit New York Philadelphia Boston

flect an improvement in steel production.

Leading ferroalloys prices in general are firm and, while buying continues well below normal, the trend in buying is upward.

Needs and Expectations In Steel Construction

(*Concluded from Page* 19)

thing about the concrete fort built within a few hours—quick-drying cement?

"These are not just our competition. Today lumber and cement are our pacemakers . . .

"Volume of structural steel has slumped with other building materials. But all the structural materials have not recovered in like ratio . . . Both lumber and cement did better than fabricated structural steel during the first half of 1938.

"That is not a particularly happy picture, but I think it proves my point—the other building materials are our pacemakers. We might do well to match them in their promotional activities. It is not just a question of making better steel or of improving the methods of fabrication and erection. Any improvement in these directions would be impotent unless you tell the world about them. In other words, we must advertise what we have."

Trade associations can be of tremendous help in keeping the national economic committee's investigation "on the ground," declared Willard L. Thorp, Dun & Bradstreet economist, and special adviser on economic studies to the commerce department.

"It is important that the full possibilities as well as the dangers of the trade association movement be most carefully reviewed. Before any conclusions are drawn, it is necessary to have a much clearer picture than is now available of what actual accomplishments are," he continued.

"When the studies now under way in the commerce department have been completed, they may indicate ways in which the association movement may contribute to improving the operation of the economic system. It is by no means inconceivable that this may call for decided revisions in our existing policies, rather than mere clarification."

T. H. Hendrix, the institute's director of statistics, reported that for the first eight months of 1938 structural steel bookings totaled 679,793 tons against 1,202,019 tons in the period of 1937, a decrease of 43 per cent.

A decided decrease appears in the requirements of steel for industrial buildings. In 1936, 22 per cent of bookings came from this source. This was increased to 32 per cent last year, while the January-August period this year furnished only 16.6 per cent.

Commercial buildings, on the other hand, have so far accounted for a much larger percentage than previously. This year 13.8 per cent of bookings have been from this source, against 6.7 per cent and 8.7 per cent in 1937 and 1936, respectively.

"The volume of prospective business is showing an encouraging trend," he said. "Since March the tonnage of contemplated projects has shown a regular upward swing."

F. H. Frankland, institute's chief engineer, in his report urged that sponsorship of research be continued "at an accelerated rate." The institute has sponsored and co-ordinated a number of research programs related to various questions of design that "urgently require investigation." These have to do with improvement of methods, design and application of structural steel to bridges and buildings.

Committee on advertising and publicity recommended the institute create an award to the person who has contributed most to the art of the design, fabrication or erection of structural steel. The committee suggested the award be a gold medal, to be named the Lloyd Kimbrough Medal in recognition of the institute's first president, and be made not more than once a year.

Interest aroused by the institute's competition for elevated highway design has been so keen that the institute has been importuned to hold more competitions, reported the committee on elevated highways.

Committee on bonding legislation reported that every state now requires contractors on either all or some of its public work to furnish bond for protection of labor and materialmen.

Recommendation: "It would be well if all federal agencies, wherever possible, required public contractors to furnish bonds similar to those prescribed by the treasury department pursuant to the provisions of the federal contractors' bond law of 1935."

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Reader Comments

(*Concluded from Page* 9)

what it would mean to the nation?

Do you realize that the young people who are walking the streets today will be our business executives 20 years hence? There is an old saying that "you cannot breed race horses from jackasses." We should adopt a twentieth century saying somewhat along these lines: "We cannot make business executives out of idle people or criminals."

Let's all be Americans and do what we can to eliminate these conditions. Let our wives stay at home and manage it the way it should be, and by so doing take care of our youngsters, relieve unemployment and reduce taxes. What more could a good American expect?

SPRING MANUFACTURER

Chicago

Activities of Steel Users, Makers

■ SPENCER Lens Co. is erecting a new plant to manufacture mechanical parts at Eggert road and Sugar road, Cheektowaga, N. Y. Building will be 210 x 410 feet, one and two stories high, steel frame with brick and glass walls. Company's production capacity will be doubled by the addition. H. E. Plumer & Associates, Buffalo, designed the building and will supervise construction. General contract has been awarded to Gilmore, Carmichael & Olson, Cleveland.

♦

Silent Hoist Winch & Crane Co., Brooklyn, N. Y., has moved its general offices and works to new and larger quarters at 841-865 Sixty-third street.

♦

Glenn L. Martin Co. has completed a drop hammer plant at Middle River, Md. The new structure has 10,000 square feet of floor space, represents a $75,000 investment, quadruples company's drop hammer capacity and provides for future enlargement.

♦

Chain Belt Co., Milwaukee, has purchased blue prints and machinery of the former Weller Mfg. Co., Chicago, and is going into production of screw conveyors and light gage sheet metal elevator buckets. It has leased 12,000 square feet of space in Chicago where most of the current production is under way.

♦

Ray-Ewbank Machinery Co., Montgomery, Ala., has been designated as distributor for county sales in the southern half of the state of Alabama by Bucyrus-Erie Co., South Milwaukee, Wis. Ray-Ewbank will co-operate with the Bucyrus-Erie branch office at Birmingham.

♦

Dravo Corp., Pittsburgh, has received an order for six light towers from the superintendent of lighthouses, Key West, Fla., for use in Tampa bay. They are to be built of galvanized wrought iron pipe, resting on 7-inch solid wrought iron piles secured by foundation screws to be sunk 10 feet in the sand. Fittings are to be cast iron.

♦

Ampco Metals Inc., Milwaukee, maker of copper alloy castings, forgings, etc., is completing improvements and an expansion program which increases capacity from 125 tons to 375 tons per month. Included is a new centrifugal casting division, and a laboratory which has been established for research on new alloys.

♦

Fort Wayne Structural Steel Co., Fort Wayne, Ind., has been formed to take over the structural steel fabricating business formerly operated as the Fort Wayne Foundry & Machine Co. The new firm will continue the structural steel fabricating and steel warehouse business and will operate at its present location until Jan. 1 when it will move to new quarters which are to be built at 4900 North Clinton street. Officers are: John L. Hayner, president; Hubert W. Hayner, vice president, and Arnold F. Benz, secretary-treasurer.

♦

American Brass Co., subsidiary of Anaconda Copper Co., has acquired the entire interests of the Roberts Brass Co., Milwaukee, which in addition to making copper and brass goods, has been a distributor of American Brass products in the Milwaukee area. The Roberts plant will be operated as a warehouse. M. J. Schaffner, president of the Roberts company, and other executives, are continuing with the new owner.

♦

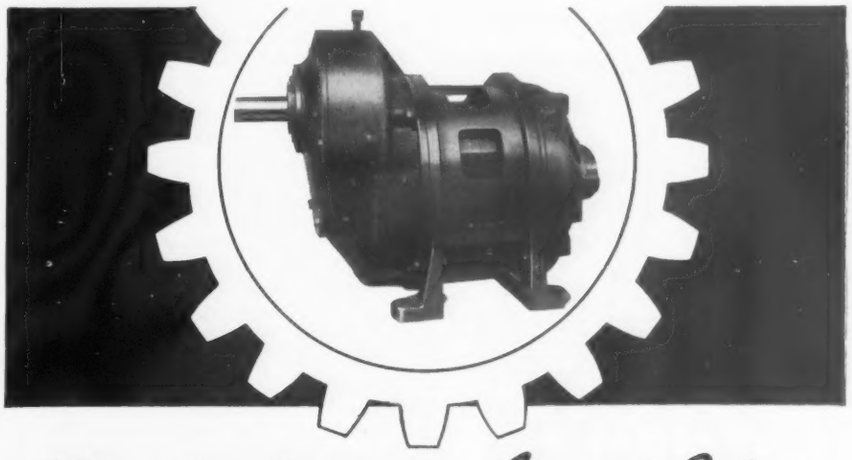
■ Allegheny Ludlum Steel Corp., Brackenridge, Pa., has issued a brochure, "Twin Engined for Progress," explaining reasons for the Allegheny and Ludlum merger, describing the company's products and applications, outlining plans for the future.

Government's Iron, Steel Purchases for Week

■ During the week Sept. 30-Oct. 8, the government purchased $863,910.12 worth of iron, steel, and their products under the Walsh-Healey act, as follows:

The Midvale Co., Washington, $104,229.13; Crucible Steel Co. of America, New York, $32,760; Erie Forge Co., Erie, Pa., $70,540.80; Truscon Steel Co., New York, $198,928; Laclede Steel Co., St. Louis, $10,177.70; United States Pipe & Foundry Co., New York, $79,304.57; Bethlehem Steel Co., Los Angeles, $10,863.97; W. S. Wetenhall Co., San Francisco, $10,665; American Bridge Co., Pittsburgh, $82,961.68; Patent Scaffolding Co. Inc., Philadelphia, $51,744; American Bridge Co., Denver, $10,921; American Bridge Co., Boston, $12,633; Belmont Iron Works, Philadelphia, $47,917; American Bridge Co., Cincinnati, $44,635; Bethlehem Steel Co., Bethlehem, Pa., $54,300; Shepard Supply Corp., New York, $22,192.60; Walter Kidde & Co. Inc., New York, $19,137.27.

■ The freighter, STEEL EXPORTER, Isthmian Steamship Co., U. S. Steel Corp. subsidiary, recently was the one hundred thousandth ship to pass through the Panama canal since its opening in 1914. Captain M. F. Barry, Brooklyn, N. Y., received a special certificate from Captain Thomas Symington, marine superintendent of the canal. STEEL EXPORTER had made 100 trips through the canal.



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Nonferrous Metals

New York — Copper continued to advance sharply last week, reaching a new high since Nov. 4 of last year. All metals advanced steadily in London due to heavy consumer and speculative buying which in turn was stimulated by prospects for steady improvement in industrial activity here.

Copper — Prices rose ⅛-cent on Monday and ¼-cent on Thursday and Friday, establishing electrolytic at 11.25c, Connecticut. All allied products moved higher in proportion. Higher prices were supported by the bullish September statistics which showed a drop of 37,070 tons in world refined stocks, including over 22,000 in domestic supplies alone. Export copper rose to around 11.50c, c.i.f. Japan continued to take substantial tonnages.

Lead — Sellers maintained a cautious price policy despite the outlook for favorable consumption rates since most consumers have covered their needs well ahead. Buying was spotty, however, with several sellers doubling their ore intake on most days. Prices held at 4.95c, East St. Louis.

Zinc — Prime western zinc advanced $2 per ton to 5.05c, East St. Louis, on Thursday. Shipments are being stepped up steadily in line with the increase in actual consumption. Galvanized sheet output is holding at the best levels of the year, or around 65 per cent of capacity. The rise here was made possible by a steady advance in London.

Tin — Prices advanced steadily in London with standard spot closing at £209 5s, or well above the lower level of the range which the Buffer Pool proposes to establish. Domestic tin prices moved higher with Straits spot closing at 45.40c.

Antimony — Buying was confined generally to case lots although larger business was done on at least two days. Prices held at 12.00c, New York, for American spot in cases and nominally 14.00c, duty paid New York, for Chinese spot.

Dravo Corp. Duplicates Welding Contest Awards

■ Duplicate prize payments were made by Dravo Corp., Pittsburgh, to four members of its organization who received awards in the James F. Lincoln Welding Foundation's contest. (STEEL, Sept. 19, p. 23).

Those who received company bonuses as well as their prizes: Gilbert H. Atwood, assistant chief draftsman, $305.26 for placing third in structural buildings, sub-class E-1; George F. Wolfe, Dravo welding committee chairman, J. F. Smith, welding engineer, and C. P. Streithoff, structural engineer, each received $101.75 for receiving hon-

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Every Room Outside with Private Bath
Single from $2.50
Double from $4.00

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GARAGE IN CONNECTION

Nonferrous Metal Prices

Spot unless otherwise specified. Cents per pound

Oct.	Copper Electro, del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Amer. Spot, N.Y.	Nickel Cathodes
7	10.62½	10.75	10.15	44.70	44.90	5.10	4.95	4.95	20.00	12.00	35.00
8	10.62½	10.75	10.15	44.70	44.90	5.10	4.95	4.95	20.00	12.00	35.00
10	10.75	10.87½	10.27½	45.00	45.20	5.10	4.95	4.95	20.00	12.00	35.00
11	10.75	10.87½	10.27½	44.85	45.05	5.10	4.95	4.95	20.00	12.00	35.00
12	Holiday.										
13	11.00	11.12½	10.52½	45.25	45.45	5.10	4.95	5.05	20.00	12.00	35.00
14	11.25	11.37½	10.77½	45.40	45.50	5.10	4.95	5.05	20.00	12.00	35.00

MILL PRODUCTS
F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 11.25c Conn. copper

Sheets
Yellow brass (high) 17.50
Copper, hot rolled 19.37½
Lead, cut to jobbers 8.25
Zinc, 100 lb. base 9.75

Tubes
High, yellow brass 20.25
Seamless copper 19.87½

Rods
High yellow brass 13.37½
Copper, hot rolled 15.87½

Anodes
Copper, untrimmed 17.62½

Wire
Yellow brass (high) 17.75

OLD METALS
Nom. Del. buying prices
No. 1 Composition Red Brass
New York 7.12½-7.25
Cleveland 7.75-8.00
Chicago 7.50-7.75
St. Louis 6.75

Heavy Copper and Wire
New York, No. 1 ..... 8.75-9.00
Cleveland, No. 1 ..... 8.75-9.00
Chicago, No. 1 ..... 8.75-9.00
St. Louis 8.75

Composition Brass Borings
New York 6.25-6.50

Light Copper
New York 7.25-7.50
Cleveland 7.00-7.25
Chicago 7.00-7.25
St. Louis 6.75

Light Brass
Cleveland 4.50-4.75
Chicago 4.62½-4.87½
St. Louis 4.75

Lead
New York 4.00-4.25
Cleveland 4.00-4.25
Chicago 4.00-4.12½
St. Louis 3.75-4.00

Zinc
New York 2.50-2.62½
Cleveland 2.50-2.75
St. Louis 2.75-3.00

Aluminum
Borings, Cleveland 6.25-6.50
Mixed, cast, Cleveland 8.75-9.00
Clips, soft, Cleveland 13.25-13.50
Mixed cast, St. Louis 8.25-8.50

SECONDARY METALS
Brass ingot, 85-5-5-5, less carloads, 11.62½
Standard No. 12 aluminum 13.75-14.25

orable mention in the commercial watercraft division.

Ore Imports Heavy

Baltimore — Several tonnages of iron ore and manganese ore were received here from Sept. 24 to Oct. 5, inclusive. Iron ore shipments included 10,500 tons from Daiquiri, Cuba, Sept. 26; 21,200 tons, Cruz Grande, Chile, Oct. 7; 22,300 tons, Cruz Grande, Oct. 4; and 3000 tons from Whyaloa, Australia, Oct. 5.

Manganese ore shipments comprised 7025 tons from Poti, Russia, Sept. 24; 6000 tons, Santiago, Cuba, Sept. 25; and 7144 tons from Burbon, Sept. 27.

Ferromanganese shipments included 174 tons from Rotterdam, Holland, Sept. 24; 300 tons from Heroen, Sept. 26; and on the same date 625 tons and 682 barrels from Sanda, Norway; also from Sanda on Sept. 26 were 1225 barrels of calcium silicon, 323 barrels of sirconium alloy and 28 barrels of chromium metal.

Philadelphia—Steel imports during week ended Oct. 8 were confined to 10 tons of steel bars, 30 tons of steel tubes and 20 tons of steel forgings, all from Sweden.

Equipment

Cleveland—Domestic demand for machine tools continues to improve spottily, with prospects for the remainder of the year good. Resumption of volume automobile production appears the strongest factor. Some inquiries have appeared from farm equipment manufacturers, and a considerable volume of small tools are being taken by miscellaneous buyers.

Seattle — Interest centers in opening of bids for additional transmission cable lines for the Bonneville power system in Washington and Oregon. Aluminum Corp. of America was low at $172,059, alternate $152,311 for cables for the Kelso-Aberdeen, Wash., line. For the Bonneville-The Dalles, Oreg., line, Phelps-Dodge Corp. Products Co. bid low at $82,489 but Aluminum was low on the alternate, $75,564. Latter company was also low at $52,349, f.o.b. Massena, N. Y., for the Oregon City-Salem line. For the Oregon City-Vancouver, Wash., project, Phelps-Dodge Corp. was apparently low at $110,465. The latter two projects involve 80 miles of cable.

Construction and Enterprise

Ohio

ANNA, O.—Village, E. G. Boles, mayor, approved bond issue to finance proposed waterworks project to cost $56,000; plans will probably mature soon. Consulting engineer, E. P. Light, Van Wert, O.

BELLEVUE, O.—City, R. E. Woleslagel, mayor, is holding a referendum on a $680,000 project including construction of municipal power plant, purchase of Ohio Public Service Co. properties, construction of distribution system and new "white way." Application filed for $306,000 PWA grant; owner's share to be supplied by bond issue. Western Construction Engineering Co., Toledo, O., consulting engineers.

BERLIN HEIGHTS, O.—Village, Werner Swonger, clerk, has filed application with PWA for a grant in the projected construction of a complete waterworks system which will cost $61,291. Carl Simon, Van Wert, O., consulting engineer.

BOTKINS, O.—Village, W. J. Taubken, mayor, has plans which will mature soon for building of $58,000 waterworks system; voters approved bond issue for project. E. P. Light, Van Wert, O., engineer.

COLLEGE CORNER, O.—Village has approved bond issue for construction of waterworks project, including fireproof building for pumping plant, at cost of $67,244; work awaits PWA grant. Engineer, Paul Albert, Oxford, O.

DAYTON, O.—Army air corps, materiel division, contracting officer, Wright field, will take bids to 10 a.m., Oct. 27, for one milling machine (circular 39-225); and to 10 a.m., Oct. 31, for two regulator assemblies, two fuel pump assemblies and two hydraulic generator assemblies (circular 39-238).

MONTPELIER, O.—Northwestern Electric Co-operative is completing specifications and is probably ready for bids on power line construction in four townships at cost of about $110,000. Arthur Sherman, Hicksville, is president; H. A. Rushee, Montpelier, engineer.

NEW WASHINGTON, O.—Village, W. E. Kibbler, clerk, plans to construct power plant costing $123,195, and has filed application for grant with PWA. Carl Simon & Associates, Van Wert, O., engineers.

NORTH BALTIMORE, O.—Village, A. M. Lloyd, clerk, awaits PWA approval of its application for grant on construction of a sewage disposal plant to cost $70,000. Consulting engineer, Smith & Niles, Toledo, O.

New York

FRANKFORT, N. Y.—Union Fork & Hoe Co. is purchasing land adjoining its plant and plans expansion which, with new equipment, will cost approximately $650,000.

NEW YORK—Metropolitan Steel Products Corp. has been incorporated with $50,000 capital to make fireproof doors, frames and trim. Rayford Alley, 30 Broad street, correspondent.

WESTFIELD, N. Y.—City is planning to construct a new sewage disposal plant as a WPA project; $55,662 grant allotted.

Pennsylvania

FRANKLIN, PA.—Borough plans to construct sewage treatment plant and pumping station to cost $195,000; PWA has granted an allotment on the project. Consulting engineer, Morris Knowles, Pittsburgh.

Michigan

CLINTON, MICH.—Village approved bond issue of $80,000 to finance proposed improvements to the municipal light plant. (Noted Sept. 19.)

DETROIT—Stenger Bumper & Mfg. Co. has let contract to Clausen Co. for erection of a new factory and office building costing approximately $35,000. Correspondent, Judge James McKenzie.

Illinois

CHICAGO—International Filter Corp., 347 West Twenty-fifth place, is taking bids for a one-story, 125 x 140-foot addition to its factory; cost estimated at $50,000. A. Epstein, architect for company.

CHICAGO HEIGHTS, ILL.—American

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IRVINE, WARREN COUNTY, PENNA.

Manganese Steel Co. has awarded contract for $100,000 to J. W. Snyder Co., 307 North Michigan avenue, Chicago, for construction of an addition to its plant. B. F. Olson, Chicago, architect. (Noted Aug. 8.)

Alabama

BESSEMER, ALA.—City, J. Bryant, mayor, will accept bids Oct. 24 for constructing 110-kilovolt substation estimated to cost $175,000. Lide & Adler, Birmingham, Ala., engineers.

BIRMINGHAM, ALA.—Alabama Power Co. plans to construct extensions to 35 of its rural lines through 15 counties in the state; has applied to REA for allotment of $1,500,000.

RED LEVEL, ALA.—City, C. M. Hall, clerk, will spend $30,000 for improvements to its waterworks; project includes work on pumping plant, hydrants, pumping equipment and tank and distribution pipe lines. Engineer, R. L. Kenan, Montgomery, Ala.

Maryland

CHESTERLAND, MD.—City has been awarded $28,000 grant by PWA in the construction of sewerage works, sewage treatment plant, sewage pumping station, cast iron force main, clarifier tank, chlorinator and sludge digestion tank. Cost will be about $63,000.

District of Columbia

WASHINGTON—PWA has allotted $4,618,375 loan and grant for five-part sewage system improvement program to abate pollution in district; project will include diversion sewers, flood gates and improvements to treatment and pumping plants.

Kentucky

BARDSTOWN, KY.—REA has allotted $127,000 grant to Salt River Electric Cooperative Corp. Inc., Ralph Frizzell, superintendent, for the construction of projected 106 miles transmission lines in five counties.

Florida

BRADENTON, FLA.—City has received PWA loan of $149,000 and grant of $121,000 on proposed waterworks improvements and developing of new water supply.

Georgia

STATESBORO, GA.—PWA has approved grant to the city for extensions and improvements to its sewerage works, septic tank, sludge drying bed and Imhoff tank; cost to be $36,000.

Mississippi

JACKSON, MISS.—Capitol Electric Power association has been allotted $206,000 by REA for erection of rural power transmitting lines in three counties.

North Carolina

DREXEL, N. C.—PWA approved allotment of $42,000 grant and $52,000 loan to city for constructing waterworks and sewerage plant. Included is 50,000-gallon steel storage tank.

KINSTON, N. C.—City voted $200,000 bonds for purchase and installation of new turbine in power house and for construction of new water tanks; estimated cost, $300,000.

PINEVILLE, N. C.—City will probably begin construction Dec. 1 on waterworks and sewer system to cost $110,000; voters approved bond issue and PWA has allotted grant for project. J. B. McCrary Co., Atlanta, Ga., engineers.

South Carolina

ABBEVILLE, S. C.—PWA allotted $435,000 loan and grant to city for completing construction of a hydroelectric power development; will erect power house with capacity for two units generating 1500 and 500 kilowatts.

Tennessee

PARIS, TENN.—Henry county has voted to issue $330,000 revenue bonds to supplement federal grant in the construction of a proposed rural distribution system.

TRIMBLE, TENN. — Gibson County Electric Membership Corp. has received $192,000 loan from REA for building of 169 miles of lines in three counties.

WHITEVILLE, TENN.—City, J. E. Hollander, representative, is planning to construct a complete electric distribution system which will cost $50,000. Freeland, Roberts & Co., Nashville, Tenn., consulting engineers.

Louisiana

BEAUX BRIDGE, LA.—City contemplates construction of water and light plant and will submit bond issue of $75,000 to voters Oct. 25.

CROWLEY, LA. — Voters have approved $200,000 bond issue to finance sewage system extension; application filed with PWA for grant of additional $152,000.

HOUMA, LA. — City has voted $360,000 in bonds as its addition to PWA funds for improvements to water supply system.

LAFAYETTE, LA. — City has voted $525,000 bond issue to finance improvements and expansion of sewerage plant, extension of water lines and purchase of new equipment.

RUSTON, LA.—Town will receive bids Oct. 20 for construction of sanitary sewerage works and waterworks extensions for which total of $108,000 is available. L. J. Voorhies, Baton Rouge, La., engineer.

SULPHUR, LA.—PWA approved $72,000 loan and $58,000 grant to city for constructing sewerage works, including laboratory equipment, pumping and treating plants.

West Virginia

CLARKSBURG, W. VA. — State health department sanctions construction of proposed $1,400,000 sewage disposal project; will apply to PWA for allotment. L. W. Collins, Clarksburg, engineer.

WELCH, W. VA.—Appalachian Electric Power Co., Richmond, Va., plans to construct power substation and lines costing $250,000 in coal fields near here to take care of new coal development projects.

WHEELING, W. VA. — Wheeling Corrugating Co., 1000 Spruce street, St. Louis, J. A. Watkins, manager, manufacturer of metal products, is receiving bids on construction of $500,000 warehouse and office building. Floor space will total 150,000 square feet.

Virginia

FREDERICKSBURG, VA.—PWA has approved grant of $50,000 for enlargement of city's filter plant which will cost $113,000. (Noted July 4.)

ORANGE, VA.—REA has allotted $160,000 to Northern Piedmont Electric Co-operative for construction of 150 miles of transmission lines in six counties.

Missouri

KANSAS CITY, MO.—Security Stove & Mfg. Co., 1630 Oakland street, has begun work on two-story factory addition, 86 x 125 feet, costing $40,000.

LATHROP, MO.—City proposes to build a municipal light plant with PWA assistance; bond issue voted.

PALMYRA, MO.—City has PWA grant for proposed improvements to electric system at cost of $66,836; work includes installation of 750-horsepower diesel generator, cooling tower and fuel oil storage tank.

PARKVILLE, MO.—City is planning to construct $72,000 diesel electric generating plant, distribution system and electric lighting system; PWA has allotted grant on project.

Arkansas

YELLVILLE, ARK.—City, H. A. Burns, commissioner, plans waterworks improvements project to cost $40,000; will issue bonds and apply for PWA grant.

Oklahoma

ANADARKO, OKLA.—PWA has approved $117,000 grant to city on a water project to cost $262,000. Work includes construction of waterworks, concrete reservoir, pipe line repair and well development.

BETHANY, OKLA.—Earl W. Baker Utilities Co., Earl W. Baker, president, has received an REA allotment of $111,500 in the construction of 142 miles rural electric lines in three counties.

CLAREMORE, OKLA. — PWA has granted $31,000 to city in the proposed installation of 500-kilowatt gas engine in its electric generating plant; cost estimated at $71,000.

DRUMRIGHT, OKLA.—City, Sam Whitlock, mayor, voted in favor of bond issue to finance generating plant and distributing system costing $280,000. W. L. Austin, Cushing, Okla., consulting engineer.

FAIRFAX, OKLA.—City has PWA grant of $77,310 for complete electric distribution system and street lighting system which will cost $171,000.

Wisconsin

KNOWLTON, WIS.—Consolidated Water Power Co. Inc., Wisconsin Rapids, Wis., is planning to erect and equip a power plant costing approximately $3,000,000.

LA CROSSE, WIS.—Interlox Steel Co. has been incorporated by J. C. Bunge, Carl Schlicht and A. L. Jahn to fabricate and manufacture steel, machinery and tools.

WISCONSIN RAPIDS, WIS.—Consolidated Waterpower & Paper Co. has filed application with federal power commission for permission to construct a $20,000,000 hydroelectric project, including dams, power plants and a diversion canal on the Wisconsin river.

Minnesota

FERGUS FALLS, MINN.—State board of control, Downer Mullen, secretary, is

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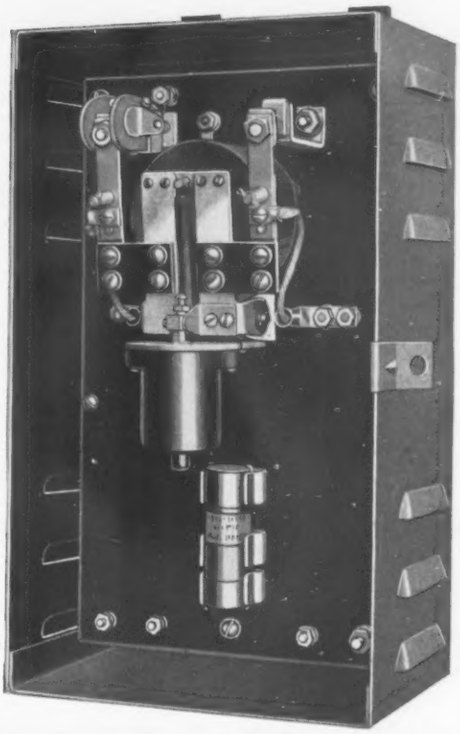

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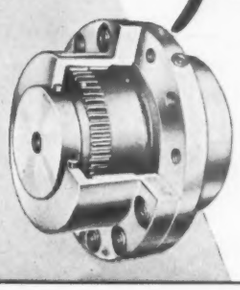

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planning to construct a power plant at the hospital here; cost estimated $290,-086. Larsen & McLaren, Minneapolis, architects.

GRAND MEADOW, MINN. — Village, O. J. Tommerson, clerk, is taking bids to 3 p.m., Oct. 24, on the construction of a sanitary sewer system and sewage treatment plant. Plans obtainable from consulting engineer, G. M. Orr & Co., Minneapolis; certified check 5 per cent to accompany bids.

MOORHEAD, MINN.—City, R. G. Price, clerk, has filed application with PWA for a grant in the extension of its municipal power plant; cost estimated at $196,195. Helmick, Edeskuty & Lutz, Minneapolis, consulting engineers.

ROCHESTER, MINN.—Allen & Skelley welding shop plans to construct new one-story plant and install additional welding equipment.

ST. PAUL—Griffin Wheel Co., car wheel manufacturer, has begun construction of one story, 50 x 152-foot factory addition.

ST. PAUL—Minnesota state highway department, E. W. Elsberg, highway commissioner, opens bids Oct. 28 for a 100,000-pound hydraulic universal testing machine suitable for compression, tension and transverse testing, to be installed in the highway testing laboratory at the University of Minnesota, Minneapolis.

STILLWATER, MINN. — City seeks PWA assistance in the contemplated project to improve its sewage plant and construct a sewer system at cost of $418,125. J. A. D. Abercrombie, city engineer.

VIRGINIA, MINN.—Virginia water and light commission, C. H. Anderson, secretary, will probably undertake improvements in its power plant which will cost $606,127. M. C. Bregen, commission superintendent is also engineer.

WINONA, MINN.—Chicago & Northwestern railway plans to install new boiler and other equipment in its railway shops.

WORTHINGTON, MINN.—City, G. S. Thompson, clerk, has applied to PWA for a grant in the improvement of its power plant at total cost of $215,127. Ralph D. Thomas & Associates, Minneapolis, consulting engineers. (Noted July 18.)

Texas

BAIRD, TEX.—City, R. L. Elliott Jr., representative, voted approval of $150,-000 bond issue for construction of light and power plant; PWA allotted additional $74,000 loan and grant. Albert C. Moore & Co., Weatherford, Tex., consulting engineers.

BIG SPRING, TEX.—City has plans under way for improvements in its waterworks for which voters approved $275,000 bond issue; project consists of construction of filtration plant, water lines and pumping plant. Freese & Nichols, Fort Worth, Tex., are consultants. (Noted Sept. 26.)

CLEBURNE, TEX.—Johnson County Electric Co-operative association has been allotted $308,000 of REA funds to enable construction of 340 miles of rural power transmitting lines in four counties.

EL CAMPO, TEX.—City, J. S. Carroll, mayor, voted to issue bonds for construction projects totaling $330,000 on light and power plant, water-plant and gas system. Freese & Nichols, Fort Worth, Tex., consulting engineers.

ELECTRA, TEX.—City, A. B. Corder, mayor has approved bond issue to finance waterworks improvements costing $90,000. J. E. Ward, Wichita Falls, Tex., engineer.

GROESBECK, TEX.—City, J. E. Bradley, mayor, will receive bids Oct. 17 for waterworks project costing $110,909, and including cast iron supply mains, 150,-000 gallon elevated tank and 600,000-gallon per day filtration plant; voters approved issuance of $80,000 bonds. Engineers, Freese & Nichols, Fort Worth, Tex.

JOHNSON CITY, TEX.—REA has allotted $1,332,000 to Tedernacles Electric co-operative for the construction of 1718 miles of power lines in 15 Texas counties. (Noted Sept. 12).

KERMIT, TEX.—PWA approved $91,-000 grant to the city for construction of water and sewerage works consisting of mains, wells, pumps, elevated steel tank, concrete ground storage reservoir and sewerage equipment. Cost estimated at $203,000.

LAGRANGE, TEX.—City proposes to construct a power distribution system and will apply to PWA for loan and grant totaling $250,000 on the project.

NEWBERN, TEX.—City has voted bond issue of $37,000 to finance its plans for improvements in water system which will cost $67,273; PWA will provide $30,-000 grant in addition.

ROBSTOWN, TEX.—City has been allotted PWA grant of $123,000 and loan of $151,000 for the construction of a light and power plant and distribution system. Garrett Engineering Co., Houston, Tex., engineer. (Noted Sept. 5.)

SAN MARCOS, TEX.—City, A. M. Ramsey, mayor, is planning construction of electric distribution system; has voted $175,000 bond issue and applied to PWA for loan and grant on project. Engineers, J. M. Beretta Engineers Inc., San Antonio, Tex.

TAYLOR, TEX.—City, H. C. Richards, manager, is making plans to construct an electric distribution system, and has filed application with PWA for $339,000 grant. Consulting engineers, J. W. Beretta Engineers Inc., San Antonio, Tex.

Kansas

GIRARD, KANS.—City, Scott Gladson, mayor, will probably improve and extend its waterworks and light plant to the extent of $138,000; application filed for PWA grant. E. T. Archer & Co., Kansas City, Mo., consulting engineer.

NEWTON, KANS.—City, K. L. Brode, manager, proposes to improve its waterworks; project provides 3,000,000-gallon steel tank, pumps, well and booster station to cost $91,104. Black & Veatch, Kansas City, Mo., engineers. (Noted Aug. 8).

NORTONVILLE, KANS.—Voters approved bond issue to finance sanitary sewer system and sewage disposal plant to cost $42,500; E. T. Archer & Co., Kansas City, Mo., consulting engineer.

North Dakota

CAVALIER, N. DAK.—City is making plans to install a 300-horsepower diesel engine in its light and power plant.

VALLEY CITY, N. DAK.—City, L. T. Halverson, auditor, is taking bids to 8 p.m., Oct. 24, on replacements and improvements in its municipal electric power and steam heating plant; maximum funds available total $150,000. Certified check 5 per cent to accompany bids. Burlingame, Hitchcock & Estabrook, Minneapolis, engineers. (Noted Aug. 8.)

South Dakota

ARMOUR, S. DAK.—City has filed application with PWA for a grant in the construction of a projected power plant and distribution system to cost $131,300. Perkins & McWayne, Sioux Falls, S. Dak., consulting engineers.

MADISON, S. DAK.—Eastern State Normal school, V. A. Lowry, president, plans to improve its power plant at cost of $25,840, and has applied for PWA allotment. Charles Trimmer, Madison, engineer.

Nebraska

LEXINGTON, NEBR.—City, A. A. Kjar, mayor, proposes to construct a sewage disposal plant to cost $46,269. H. S. Nixon, Omaha, Nebr., consulting engineer.

Iowa

ANITA, IOWA—City, A. F. Darron, mayor, is seeking PWA assistance in the projected construction of an electric power plant and distribution system to cost $111,000. Young & Stanley, Muscatine, Iowa, consulting engineers.

DES MOINES, IOWA—City, John MacVicar, superintendent of streets and public improvements, has filed application with PWA for a grant to aid proposed construction of a sewage purification plant to cost $188,000 with building and equipment. John Tippee, Des Moines, is consultant.

MANLY, IOWA—City has plans in progress for building municipal electric plant using diesel generator units and accessories. Cost to be about $125,000; financing being arranged.

OTTUMWA, IOWA—City proposes to construct a sewage treatment plant at cost of $1,172,515 and has filed application seeking PWA assistance in the project. H. E. Cook, city engineer.

WATERLOO, IOWA—Jerald Sulky Co., S. E. Jerald, president, plans to construct soon a one-story factory building, 58 x 100 feet, and to install machinery for manufacturing agricultural equipment.

WEBSTER CITY, IOWA—City, E. R. Compton, manager, is planning to construct an addition to its power plant and install a boiler at cost of $166,562; has applied to PWA for a grant. Consulting engineer, Buell & Winter Engineering Co., Sioux City, Iowa.

Wyoming

LANDER, WYO.—City has applied to PWA for a grant in the construction of an electric light and power plant costing $250,120. Charles Cameron, Lander, engineer.

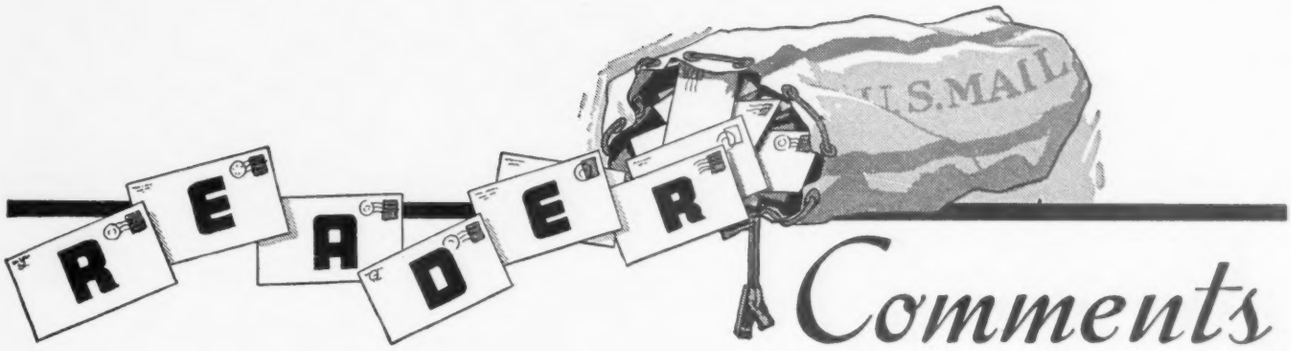
Utah

ORDERVILLE, UTAH—Garkane Power Co., R. B. Blackburn, president, has been awarded $177,000 REA allotment for erection of power transmitting lines and generating plant.

Pacific Coast

PORTLAND, OREG.—Rich Mfg. Co., Los Angeles, has acquired acreage for plant to manufacture valves, hydrants, plumbing and cast iron sewer pipe; cost to be $250,000. Foundry production scheduled to begin in 60 days.

LEAVENWORTH, WASH.—Voters have approved bond issue for sewage disposal plant and water system estimated to cost $288,000. Parker & Hill, Seattle, engineers.



Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

An Error About Oils

To the Editor:

In the Oct. 17 issue of STEEL, page 60, you mentioned that I, as chairman of the committee on gear lubrication of the American Gear Manufacturers' association, said that 600W should not be used as a gear lubricant.

I believe my remarks were misunderstood and would like to have the statement corrected.

600W has been used very successfully for years as a gear lubricant and for ordinary conditions should prove entirely satisfactory. What I was trying to stress was that the class of black oils, usually called for by the consumer by the general name of 600W, not being so highly refined, may not be so suitable for applications where a high degree of stability is desired.

In these cases the more highly refined oils might be more desirable and give better results. It was a bad mistake to refer to these black oils as the 600W type as it creates a wrong impression concerning 600W oil, especially as it is the trade name of one of the large oil companies.

Will you please, therefore, make this correction in your next issue?

H. A. MCCONVILLE
Schenectady Works laboratory, General Electric Co.

Getting the Story Over

To the Editor:

Industry actually is undertaking the job of putting into the mind of the man on the street some real facts about the benefits a community receives from the presence of a manufacturing plant. Broader recognition of the necessity for meeting and counteracting adverse publicity is evident.

Some companies distribute periodical statements to employes in which the financial situation, division of earning and other facts are given, so the worker may understand management's problem. The radio is being used to spread the fact that employment and payroll distribution are important to all residents in a community.

Those of us who live in Ashland, Ky., and the surrounding communities had an object lesson this week when the benefits of the steel mills located here were stressed in an all-day celebration, the anniversary of continuous sheet rolling.

Facts about the city's growth in population, in business interests and property value were presented in a way to impress everyone. The lesson should do much to strengthen workers' allegiance to employers.

Doubtless many other communities could find occasions for similar celebrations where helpful information about industry's benefits could be dramatized. At least such occasions would broaden the number to whom the message could be delivered.

Perhaps this may prove the bridge to close the gap between employer, worker and general public. At any rate, in our community we know a great deal more about what the steel mills have done for every one of us in distributing a large payroll every week. Troublemakers seeking to arouse workers against their employers will find their task made more difficult by such events.

SHEETMAKER
Ashland, Ky.

Autos Broaden Steel Use

To the Editor:

When the automotive industry is referred to as the leading consumer of steel products it is probable that in most instances its full contribution is not recognized. An industry which for five consecutive years has consumed more than 20 per cent of total steel production in the United States is of prime importance and its direct requirements are of vast importance.

In order to provide facilities for about 30,000,000 cars and trucks streets and highways must be provided, requiring more steel. For their safe operation highways must be elaborated to reduce hazards.

This fact was borne in on those who listened to Dr. Miller McClintock, of Yale, addressing the Institute of Steel Construction's recent convention. His statement was that safety and efficient operation of automotive vehicles in urban districts warrant construction of 1000 miles of bridges. This includes elevated highways, which are bridges in effect, and steel is the only material from which they can be built. Their tremendous cost is justified by the figures he adduced, returns resulting from safe high speeds more than repaying the expense. He presented no estimate of the steel tonnage this would require.

Dr. McClintock's forward look opens a vista of great promise to steelmakers, such construction replacing the tonnage formerly going into steel rails, which have dropped from a major to a minor outlet as the transportation picture has changed.

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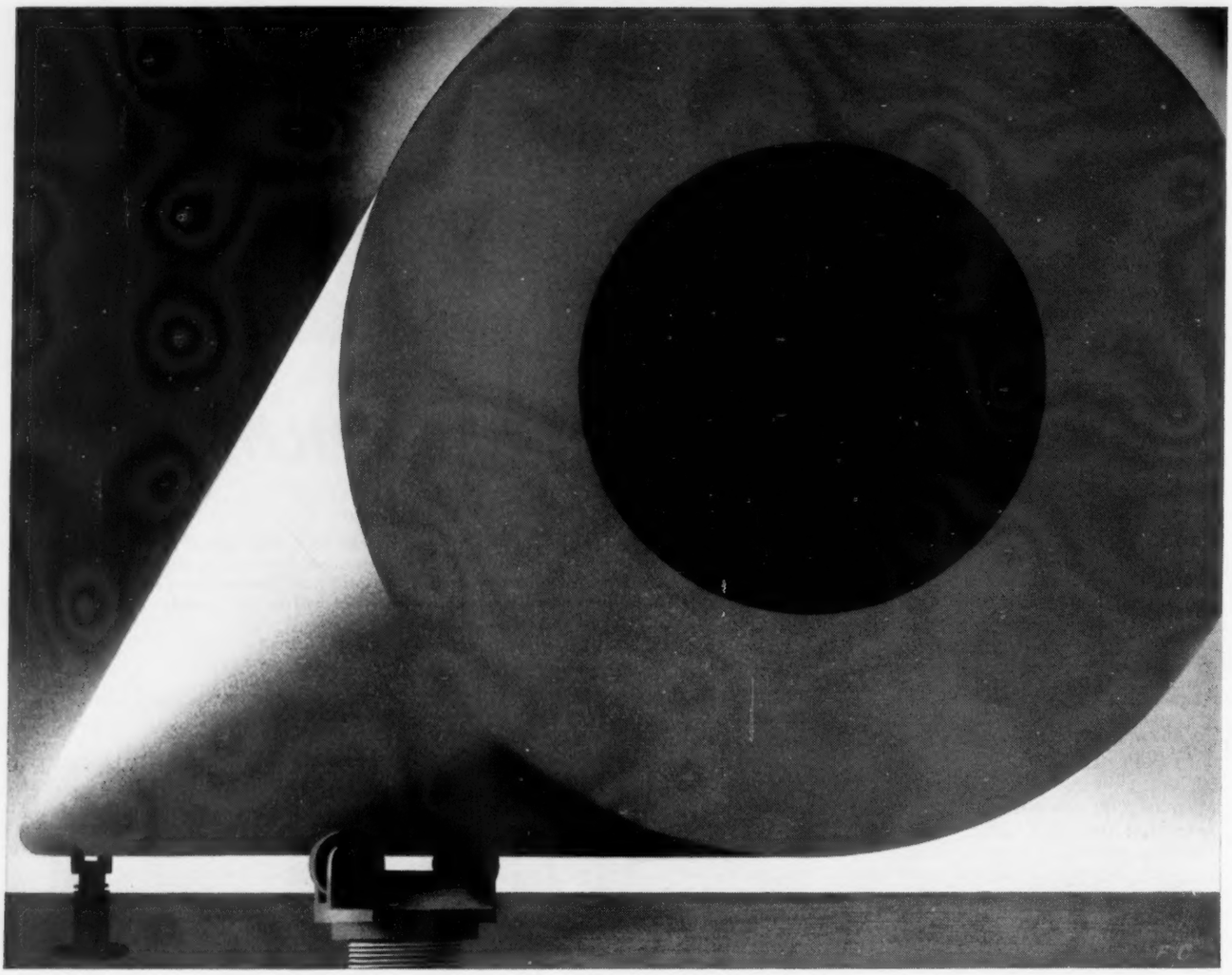

HUGE—YET UNIFORM IN PHYSICAL PROPERTIES

NECESSITY hastens many a discovery. When deep drilling in the oil industry created the need of extra-heavy, extra-durable drill collars, their service requirements and economical construction presented some new machine-shop problems. Among them was the finding of a steel which could be heat treated in long, massive chunks (sometimes 8 tons and 40 to 50 feet long) to produce uniform high physical properties and yet be readily machinable.

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